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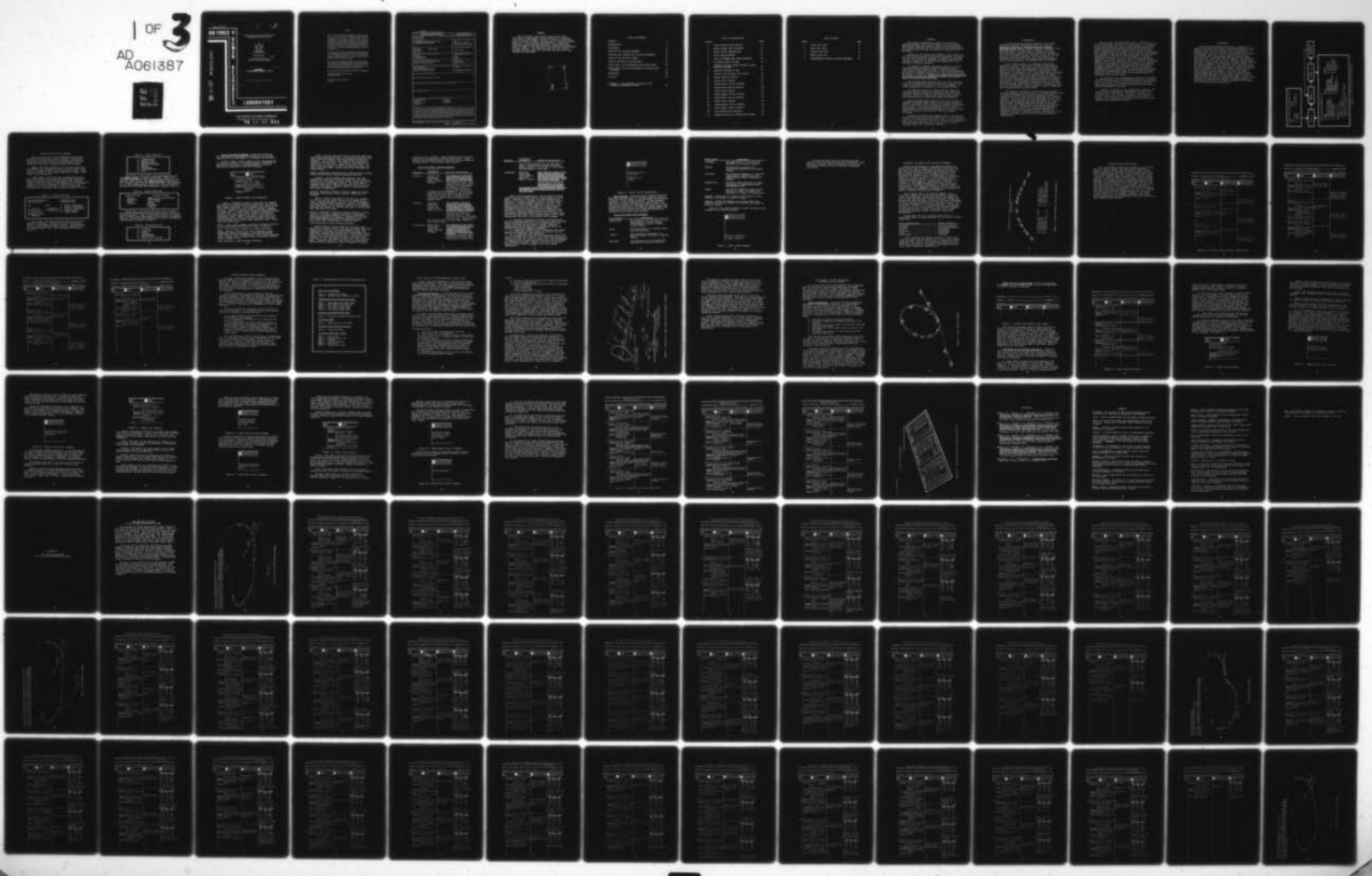

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AIR FORCE HUMAN RESOURCES LABORATORY

DEVELOPMENT AND APPLICATION OF A TASK TAXONOMY FOR TACTICAL FLYING

Volume I.

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September 1978

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AIR FORCE SYSTEMS COMMAND
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This final report was submitted by Design Plus, 141 Meadowlark Drive, St. Louis, Missouri 63141, under contract F33615-77-C-0020, project 1123, with Flying Training Division, Air Force Human Resources Laboratory (AFSC), Williams Air Force Base, Arizona 85224. Dr. Bernell J. Edwards was the contract monitor.

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This technical report has been reviewed and is approved for publication.

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A taxonomy of tactical flying skills was developed as a user oriented skill-task analysis system for practical application in solving Tactical Air Command continuation training problems and for a behavioral data base for skill maintenance and reacquisition training research and development. Sixteen representative tactical air-to-air and air-to-surface maneuvers were analyzed and classified within the system, with provision for later expansion. A classification system was developed to accommodate the complexities of tactical flying. A data system was organized with sufficient flexibility to objectively address many areas of tactical flying. The taxonomy system also included methodology for addressing on-going training problems and requirements.

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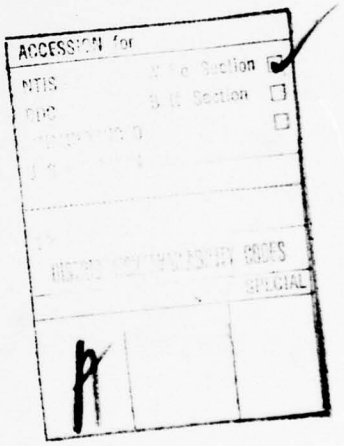
SUMMARY

This is Volume I of a three volume report which describes the development and application of a taxonomy of tactical flying tasks. Volume I details the procedures used to develop a surface task analysis of selected tactical maneuvers. This technique proceeded from a behavioral stimulus-organism-response paradigm in describing flying tasks in terms of the sequential pilot-aircraft relationships as task elements. The resulting data from the surface analysis process became the data base from which the task taxonomy was generated.



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PREFACE

This report represents a portion of the research program of Project 1123, United States Air Force Flying Training Division, Mr. James F. Smith, Project Scientist; Task 112302, Instructional Innovations in the United States Air Force Flying Training, Mr. Robert R. Woodruff, Task Scientist.

Credit for the initial development of this study as a contract effort belongs to Capt Jack Thorpe who is now with the Air Force Office of Scientific Research, Bolling AFB. His work in writing the statement of work and guiding the formative stages of the contract was fundamental to the success of the final product.

Dr. Edward E. Eddowes, Technical Advisor, Air Force Human Resources Laboratory, Flying Training Division, Williams Air Force Base, Arizona, provided much guidance and insight throughout this effort. His contributions were particularly valuable because of his close association with Mr. Meyer in producing a *Behavioral taxonomy of undergraduate pilot training tasks and skills*, a research effort upon which the present study was based.

The authors express appreciation to Lt Col Tom Rush, Chief of the 4444th OS, Luke Air Force Base, Arizona, and to Maj Kirk Ransom and Maj Dick Phillips, TAC/DOOS, for their cooperation and support in the contract effort.

An essential element for this study was obtaining interview data from aircrew personnel at the 334th and 336th OS, Seymour Johnson Air Force Base, North Carolina. The focal point for coordinating these interviews was Capt Larrie Harlan, to whom the authors are grateful.

Capt Bill Schnittger, Chief of the F-4 Instructional Systems Development Team, Luke Air Force Base, Arizona, acted as principal liaison between the Contractor/Contract Monitor and the Tactical Air Command personnel involved in this project. The authors appreciate his continuing cooperation and contributions throughout the study, without which the contract could not have been successfully completed.

Valuable information and suggestions for the project were contributed during various meetings with the Contractor by Maj J. D. Brown, Capt Dave Yates, Maj Al Lavoy, Maj Bill Mack, Capt Jim Icenhour, and Mr. Don Alford of the 4444th OS, Luke Air Force Base, Arizona, and by Lt Col Dick Lee, TAC/TAWC, Eglin Air Force Base, Florida.

INTRODUCTION

In 1974 the Flying Training Division of the Human Resources Laboratory supported a study to develop a Behavioral taxonomy of undergraduate pilot training tasks and skills (Meyer, Laveson, Weissman & Eddowes, 1974). The objective of the study was to develop a uniquely detailed method of classifying the fundamental flying abilities which underlie the UPT program. By focusing on the pilot's aircraft control behavior, rather than on the training maneuvers themselves, the study produced an efficient and economical data system from which improved flying training concepts and methods could be derived.

In the present study, the taxonomic foundations developed for the UPT have been extended to the tactical flying task domain. The objective of this effort was to produce a task classification system for tactical flying which would go beyond the bounds of a descriptive task analysis as an analytical tool. Using this system, training developers could determine and substantiate the content of training programs. They also would be able to analyze various training problems and develop alternative solutions. The approach throughout the present study was to document each stage of the development and application of the task taxonomy so that operational personnel would have a working set of procedures from which to proceed. Accordingly, the information presented in this technical report is organized for the operationally oriented user.

The report is presented in three separate volumes. Volume I documents the development of a surface task analysis of sixteen representative tactical tasks and presents instructions to the user on how to generate such a surface analysis. Volume II explains the development and use of a system of classification rules and describes how the rules were applied to generate the taxonomic system in a data matrix form; the second section of Volume II contains instructions for classifying data and developing the taxonomic structure. Volume III of the report presents a series of applications of the taxonomic system as an analytical tool and illustrates how the taxonomy can be applied to a range of training problems and questions. The examples used were taken from an operational training organization.

Using the UPT taxonomy (Meyer, et al., 1974) as a point of departure, the focus of Volume I was on the analysis of tactical flying tasks and the development of an analysis format compatible with classification system requirements. A technique called surface task analysis was developed. Since it constituted the raw data for the taxonomy, great care accompanied the development of the surface task analysis. The accuracy of raw data in the surface analysis would affect the integrity of the entire taxonomy system. Rules were carefully structured for use in performing the surface analysis on specific air-to-air and air-to-ground flying tasks. Since it was beyond the scope of the study to address the entire task domain of tactical flying for all tactical aircraft, representative tasks and aircraft were selected. A sample of sixteen tactical maneuvers was selected as representative of tactical flying: seven air-to-ground maneuvers and nine air-to-air. These representative tasks became the informational source for the surface analysis which provided a critical input to the establishment of a real-world oriented data base.

In addition to the representative maneuvers, the F-4E aircraft was selected as a representative tactical aircraft since it has both air-to-air and air-to-ground capabilities, and a wide base of pilot experience exists in the F-4E. Thus, the task analysis for the present effort was based on pilot performance in the F-4E.

Volume I is divided in two independent sections. The first section documents the development of surface task analysis rules and format. The second describes the application of this analysis technique in a step-by-step manual. The manual has been prepared so that flying personnel could perform a successful surface task analysis without prior analysis experience.

BACKGROUND

The surface analysis was defined as a sequence of cues, mental actions, and motor actions performed in close temporal proximity and directed toward the completion of a specific task. The end product of the analysis was a complete description of a flying task or maneuver, sequence by sequence. The cues were the inputs which a pilot received from his flying environment to perform a basic task sequence. These cues were processed by the pilot, by means of a specific mental action. Finally, outputs were the result of the mental action in the form of motor actions, typically movements of the aircraft flight controls. Of the three elements in this sequence, the mental action was the most difficult to describe; however, appropriate mental action categories were developed based on the cues and motor actions of each sequence. The Pilot-Aircraft Relationships shown in Figure 1 describe the Stimulus-Organism-Response (SOR) analysis model rationale used by psychologists (Woodworth & Schlosberg, 1954). The cue, mental action, motor action sequence adapted for this study utilized the SOR concept; however, the terminology was specifically tuned to the flying vernacular and the needs of the flying training researchers.

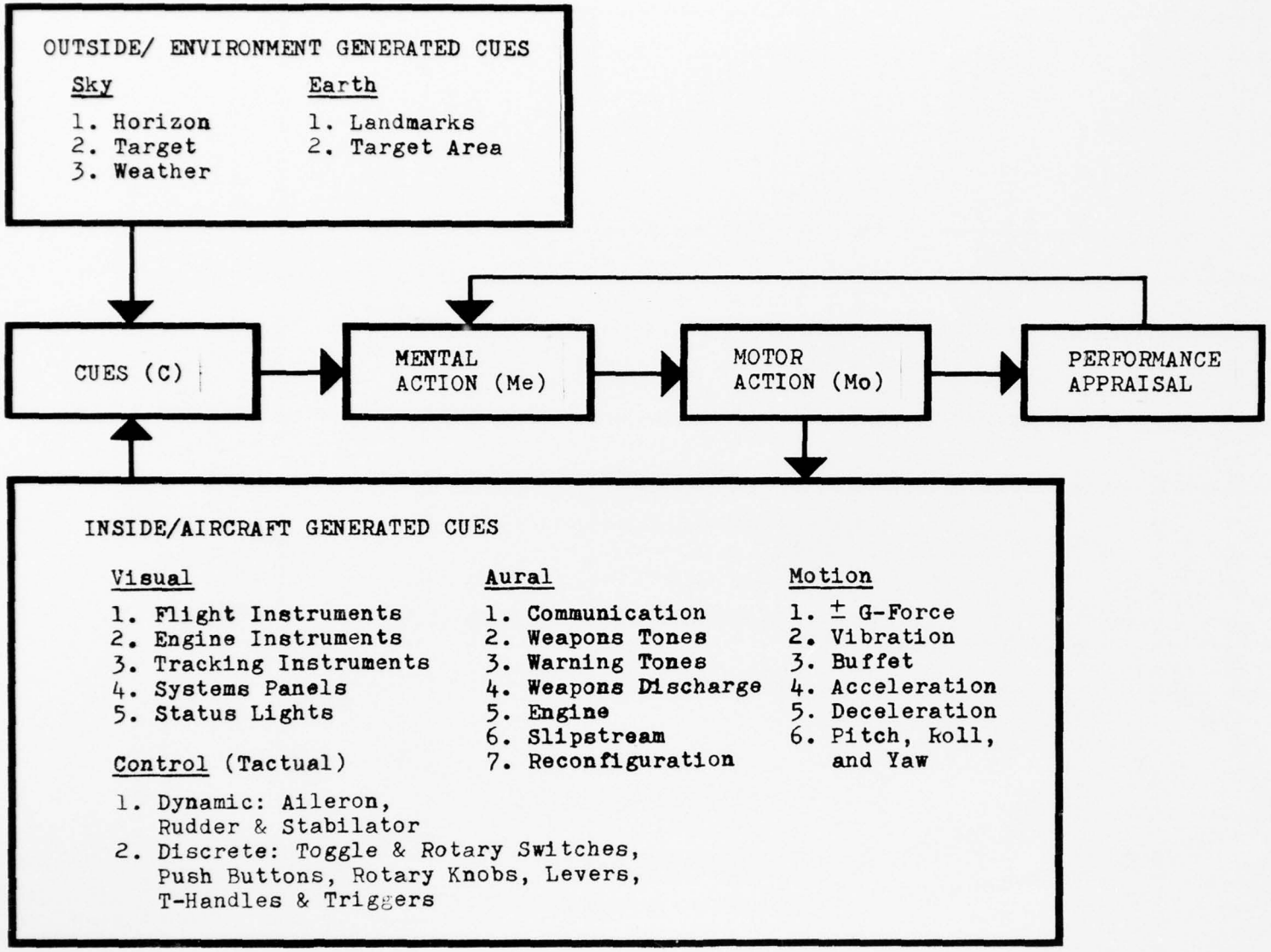


Figure 1. Pilot-aircraft relationships.

SURFACE TASK ANALYSIS ELEMENTS

The cues (C), mental action (Me), motor action (Mo), or C-Me-Mo sequences as primary behavioral descriptors constituted the foundation of the surface task analysis. It will be necessary, therefore, to understand how the categories within each element sequence were defined.

Cues - Cues were defined as all the inputs from the aircraft and the outside world which could be used by the pilot to properly perform a particular flying task. These cues were divided in four basic categories: visual, aural, control, and motion cues.

Visual Cues - The visual cues (everything the pilot sees) were divided into outside or environment generated cues; and inside, or aircraft generated cues. Typical outside visual cues would be the horizon or cloud formations. Inside cues would be information obtained from flight instruments or a radar display. A list of visual cues developed for the surface task analysis is shown in Table 1.

Table 1. Visual Cues List

Outside/Environment Generated Cues		Inside/Aircraft Generated Cues
Sky	Earth	1. Flight Instruments
		2. Engine Instruments
1. Horizon (pitch & bank)	1. Landmarks	3. Tracking Instruments
2. Target or Leading Aircraft	2. Target Area	4. Status Lights
3. Weather		5. System Panels

Aural Cues - The aural cues were divided into eight specific categories. The most basic aural cues were engine and slipstream background sounds. Other examples of aural cues included warning tones and standard UHF or VHF communications. The eight categories are shown in Table 2.

Table 2. Aural Cues List

1. Communication
2. Weapons Tones
3. Warning Tones
4. Weapons Discharge
5. Engine
6. Slipstream
7. Reconfiguration
8. Hits

Control Cues - The control cues were separated into the dynamic tactual (aileron, stabilator, rudder, and throttle) pressures of the flight controls exerted on the arms and legs, and the more discrete tactual pressures of such things as switches and knobs involved in the operation of all other system control functions. The cues selected for use in the surface task analysis are shown in Table 3.

Table 3. Control Cues List

Dynamic Tactual	Discrete Tactual
Aileron	Toggle and Rotary Switches
Stabilator	Push Buttons
Rudder	Rotary Knobs
Throttle	Levers
	T-Handles
	Triggers

Motion Cues - The motion cues were noted as stimuli which could be sensed by the body receptors as a result of aircraft movement. Some of the typical motion cues sensed were vibration, pitching movement, and positive or negative G-force. The motion cues determined for use in the surface task analysis are shown in Table 4.

Table 4. Motion Cues List

1. ± G-Force
2. Vibration
3. Buffet
4. Acceleration
5. Deceleration
6. Pitch, Roll, and Yaw

Use of the Cues Categories - Rules and procedures were developed for the specific application of the cues categories in the performance of a surface task analysis.

Figure 2 shows a sample format of the cues categories as they would appear in a surface analysis. Reference to this format will assist in understanding the rules or procedures pertaining to each cues category.

EL. SEQ.	1 CUES
A.	CONTINUES STRAIGHT AND LEVEL AT CRUISE POWER Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound Control-Neutral aileron, stabilator & rudder pressure Motion-Normal G

Figure 2. Sample format cues categories.

Visual - Referring to Table 1, note that the outside pitch and bank attitude cues are listed first and refer to the aircraft in relation to the horizon under Visual Flight Rules (VFR) conditions. Other potential outside visual cues are: target or leading aircraft, weather, landmarks, or target area. A double space was used to separate horizon cues from all other visual cues. Inside cues were also listed in the order suggested in Table 1, with flight instruments first. When an Instrument Flight Rules (IFR) flying analysis was performed, pitch and bank attitudes were listed above all other flight instrument cues. Visual cues are listed below:

Pitch: Level, Climb, Descent, Constant, Constant Variable*, and Increasing/Decreasing/Constant Climb or Descent

Bank: Level, Rolling, Constant or Constant Variable*

Target, Weather, Initial Point (IP), Landmarks, Flight Instruments, Engine Instruments, Tracking Instruments (sight picture, radar presentation), Status Lights (warning, ready, lock-on, etc.), Systems Panels (navigation communication, armament, etc.)

*This describes a close tracking situation.

Aural - The two most basic aural cues were engine and slipstream background sounds. For analysis purposes, these were considered "normal" aircraft sounds when they were constant. Any variation from constant was considered a change in aircraft sound. For example, the reduction of power would be noted as a change in aircraft sound. All other aural cues should be noted as they occur below the basic aircraft sounds. Typical aural cues or sounds are listed below:

Engine, Slipstream, Reconfiguration, Communication, Weapons Tones, Warning Tones, Weapons Discharge, and Hits

Control - In the surface task analysis, the term "stabilator" refers to the pitch control of the aircraft. Reference to the rudder included either manual input or an aileron/rudder interconnect system. The term "neutral pressure" was used to describe a control condition if the aircraft was trimmed. Typical control cues are derived from those listed below:

Aileron, Stabilator, Rudder, Throttle, Toggle and Rotary Switches, Push Buttons, Knobs, Levers, T-Handles, and Triggers

Motion - Motion cues made up the last cue category. The motion cues are stimuli which can be sensed by the body. Physical pressures, such as: positive or negative G-forces, acceleration, vibration, pitching, and yawing, were identified. In the surface analysis, 1 G flight was described as "normal G." Motion cues used in the analysis were described as follows:

Normal G, Unloaded G, Positive G Onset, Negative G Onset, Constant Positive G, Constant Negative G, Increasing Positive G, Increasing Negative G, Decreasing Positive G, Decreasing Negative G, Vibration, Buffeting, Pitch and Roll (Increasing/Decreasing/Stabilized/or Constant Variable*), Yaw, Acceleration, or Deceleration

*This describes a close tracking situation.

Mental Actions - As perceived by the pilot, cues resulted in various types of cognitive processes which were termed mental actions. This was pragmatic rather than theoretical, since mental processing for purposes of a behavioral taxonomy was regarded as an input/output system rather than a psychological construct. The mental action category involved four separate mental processes which were basic to the performance of most hand, foot, and eye tasks. Discerns, sustains, anticipates, and determines were selected as behavioral verbs to describe the mental

actions for this analysis. Each behavioral verb is listed below with its respective cognitive description. These descriptions are specifically oriented to flying situations as they pertain to the surface task analysis.

Use of the Mental Action Categories

Behavior	Information Processing	Cognitive Description
Discerns	Specific Cue Processing (Short Term Memory Process/ Storage)	This behavior occurs with the perception and recognition of a specific cue. This process utilizes short term memory storage. The identification of a desired airspeed, the observation of a specific point at which a task sequence is to begin, or the comprehension of a verbal communication are examples of the activities which require that cues perceived be remembered only long enough to recognize the correlation with an actual situation and a desired state.
Sustains	Continuous Iterative Processing (Short Term Memory Process)	This behavior occurs as cyclic short term memory processing that maintains a task segment in which cue parameters remain constant. It is the mental activity required to control an aircraft during a turn, after the roll in, and before the roll out. Similar mental activity may occur during climbs, descents, and cruise flight.
Anticipates	Memory Recall Processing (Long Term Memory Process/ Storage)	This behavior occurs prior to a particular portion of a task and triggers the decision process for a number of subsequent task sequences. It is the precursor of subsequent mental actions and involves the recalling of learned facts

Behavior	Information Processing	Cognitive Description
		and routines required for the planning of tasks. Anticipation involves long term memory storage of procedures or facts about the performance of the task.
Determines	Multi-Cue Processing (Short Term & Long Term Memory Process)	This behavior occurs in the basic decision making and problem solving processes and always involves multiple cues and evaluations. This is the most elaborate and complex mental activity. Determination also identifies the decision making and problem solving processes which ascertain the extent a motor action should be done or has been done.

Mental Action Combinations - Not all mental actions could be clearly defined, even in the analysis of simple tasks. This was all the more true when attempting to describe the complex processes involved in basic fighter maneuvers. For more complex functions, rules for the mental action category were expanded to include a time sharing capability. This allowed the mental action to accommodate dual mental processing in a single skill sequence, thereby creating a real-world situation where the pilot's cognitive apparatus/structure appears to be successfully processing more than one type of mental function at the same time. The following mental action combinations were utilized in the surface task analyses.

1. Sustains (Continuous Iterative Processing) was used with Discerns (Specific Cue Processing) when the motor action resulting from specific cue processing did not require the need for new control outputs. Example: Communication was discerned and comprehended while the aircraft flight path remained unchanged.
2. Anticipates (Memory Recall Processing) was always used with Sustains since anticipation involved only the planning of subsequent task sequences.
3. Sustains was also used with Determines (Multi-Cue Processing) when the outcome of the determination would not result in an aircraft control output, e.g., the transmission of communication or system setup while the aircraft flight path remained unchanged. Figure 3 presents the surface analysis mental action category with a time shared combination.

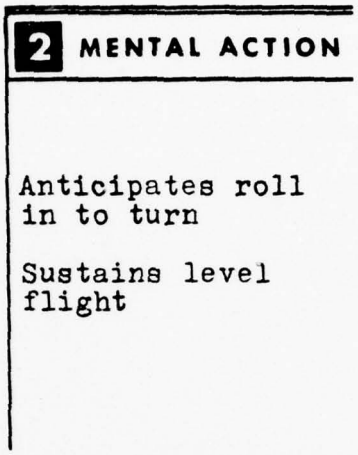


Figure 3. Mental action combinations.

Motor Actions - The motor action category described what the pilot did with the aircraft flight controls or subsystem controls based on the preceding cues and mental actions in a task element sequence. It was necessary, therefore, to select proper action verbs which would adequately describe the resulting motor activity. This category was expanded to encompass the actual flying and system functions involved in tactical flying tasks. The following are the motor action verbs and descriptions adopted for the surface task analysis.

Use of the Motor Action Category

Action Verbs	Description
Coordinates	The movement of two or more controls simultaneously in their proper relationship to obtain a desired control effect.
Moves	The displacement of a control from a previous position.
Adjusts	The incremental regulation of a specific control to obtain a desired effect.
Maintains	The continuation of a controlling pressure on an aircraft control.

Action Verbs	Description
Increases	The augmentation of a controlling pressure on an aircraft control.
Relaxes	The reduction or easing of a controlling pressure on an aircraft control.
Activates	The discrete engagement of a specific toggle switch, push button, knob, rotary switch, lever, T-handle, or trigger.
Communicates	The motor action involved in either initiating or acknowledging radio transmissions (RT).
Checks	The act of turning the head or head and body in order to inspect the position of a target, or target area.

Example: Checks six (6 o'clock or aft position of the aircraft) for target or possible target.

Example: Checks 360 degrees (or as much azimuth and elevation as possible around the aircraft) for target or possible target.

Figure 4 is a typical example of how the motor action appears in the surface analysis.

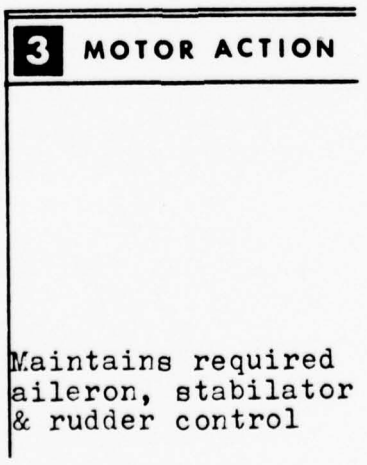


Figure 4. Motor action example.

It should be noted that for this surface task analysis, the pilot was considered to be perfect. This rule was adopted in order to eliminate the need for developing a drawn out list of multiple contingency activities.

RATIONALE FOR SURFACE TASK ANALYSIS SEQUENCES

During the development of the surface analysis, it became evident that a logical framework would be required upon which to base the sequencing of task activities. It was noted that groups of related task element sequences were preceded by an anticipatory mental process. This rationale was expanded into a procedure which could be formalized in order to achieve a consistency of expression within the surface analysis. It was determined that a complete maneuver could be thought of as a combination of a number of task segments. Each segment or element sequence had the common denominator of being anticipated or planned and followed by sequences to the next anticipation point. This suggests a chaining effect in which the element sequences comprising a maneuver can be labeled and shown in temporal proximity as in Figure 5.

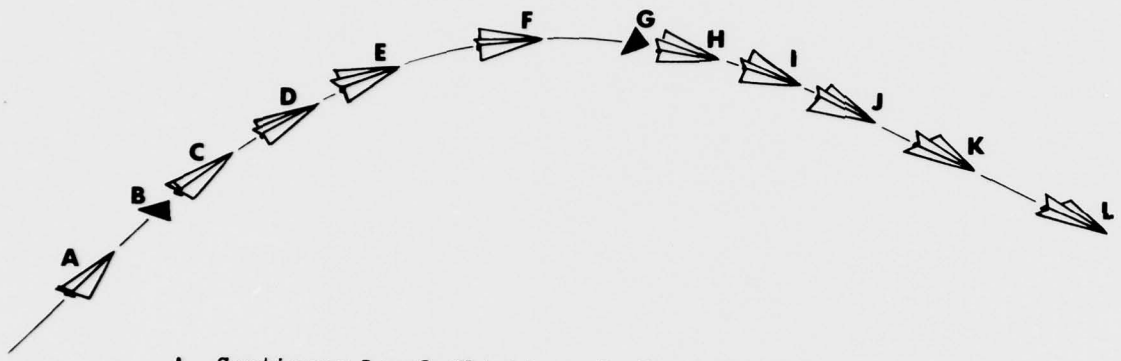
The 90 degree level turn shown in Figure 5 is a relatively simple task having two anticipation sequences within its framework. Using this turn as the example, it can be noted that Prepares, Starts, Continues, Stops, and Establishes have been used to describe the major milestones of action for the transitions from straight and level flight to the establishment of the proper bank (turn rate of the aircraft). The turn rate, once established, is sustained or held until roll out is planned. The transition segment to straight and level flight is described by the same milestones (Prepares, Starts, Continues, Stops, and Establishes).

Listed below are basic sequence names with the appropriate mental actions developed for the basic 90 degree level turn.

Basic Sequence Name	Mental Action(s)
Continues	Discerns/Sustains
Prepares	Anticipates/Sustains
Starts	Determines
Continues	Determines
Stops	Determines
Establishes	Sustains

As the analysis development continued, it was found that this basic sequence format could be utilized, though often modified, even in the analysis of complex air-to-air maneuvers; thus making the analysis more predictable and fulfilling the need for a measure of consistency required for a useful taxonomic classification.

SITUATION AT "A" - Aircraft straight and level at cruise power



A. Continues Level Flight
B. Prepares Turn
C. Starts Roll In
D. Continues Roll
E. Stops Roll In
F. Establishes Level Turn
G. Prepares Roll Out
H. Starts Roll Out
I. Continues Roll Out
J. Stops Roll Out
K. Establishes Level Flight
L. Continues Level Flight

Figure 5. Basic 90 degree level turn sequences.

SURFACE TASK ANALYSIS FORMAT

The task analysis format was developed to accommodate the cue, mental action, and motor action categories. Figure 6 shows a surface task analysis of the 90 degree level turn maneuver discussed in the Rationale For Surface Task Analysis Sequences. The analysis format shows that it has been arranged into three distinct vertical columns labeled 1. CUES, 2. MENTAL ACTION, and 3. MOTOR ACTION. The task identification block is situated above the three columns. It contains essential information regarding the task such as describing the aircraft "state" at the time the task sequence analysis is to commence. The task block identifies the task, while the task goal describes the required objective of the maneuver. The element sequences (EL. SEQ.) are listed alphabetically (A, B, C, D, etc.) and identify or address each sequence within the total task. At the beginning of each element sequence is the basic sequence name, such as CONTINUES, PREPARES, and STARTS, which describes the major milestones within the transitional task segment being analyzed.

SITUATION Aircraft straight and level at cruise power and trimmed.

TASK NO. 01 **TASK** 90° level VFR turn **AIRCRAFT** General

TASK GOAL Roll in 45° - 60° bank and roll out to perform a 90° level turn. **DATE** 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	CONTINUES STRAIGHT AND LEVEL Visual-Pitch att: level Bank att: level Landmarks Aural-Normal aircraft sound Control-Neutral aileron, stabilator & rudder pressure Motion-Normal G	FLIGHT Discerns start point for turn Sustains level flight	Maintains required aileron, stabilator and rudder control
B.	PREPARES FOR LEVEL TURN Visual-Pitch att: level Bank att: level Landmarks Aural-Normal aircraft sound Control-Aileron, stabilator and rudder pressure Motion-Normal G	Anticipates roll in to turn Sustains level flight	Maintains required aileron, stabilator and rudder control
C.	STARTS ROLL Visual-Pitch att: level Bank att: level Landmarks Aural-Normal aircraft sound Control-Aileron, stabilator and rudder pressure Motion-Normal G	Determines position to begin roll in	Coordinates aileron & rudder with stabilator pressure

Figure 6. 90 degree level VFR turn. (Pages 22-25)

SITUATION Aircraft straight and level at cruise power and trimmed.

TASK NO. 01 **TASK** 90° level VFR turn **AIRCRAFT** General

TASK GOAL Roll in 45° - 60° bank and roll out to perform a 90° level turn. **DATE** 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
D.	CONTINUES ROLL Visual-Pitch att: increasing Bank att: roll Landmarks Aural-Normal aircraft sound Control-Increased aileron, stabilator & rudder pressure Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate & need for power	Maintains coordinated aileron and rudder pressure, increased stabilator pressure, adjusts throttle
E.	STOPS ROLL Visual-Pitch att: increasing Bank att: roll Landmarks Flt.Instr:ADI,Alt,A/S Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, increased stabilator pressure, throttle advance Motion-Increasing positive G, pitching up, rolling	Determines proper bank attitude achieved	Coordinates aileron and rudder with stabilator movement
F.	ESTABLISHES LEVEL TURN Visual-Pitch att: constant Bank att: constant Landmarks Aural-Normal aircraft sound Control-Neutral aileron & rudder, increased stabilator pressure Motion-Constant positive G, pitch and roll stabilized	Sustains level turn	Maintains required aileron, stabilator & rudder pressure

SITUATION Aircraft straight and level at cruise power and trimmed.

TASK NO. 01 **TASK** 90° level VFR turn **AIRCRAFT** General

TASK GOAL Roll in 45° - 60° bank and roll out to perform a 90° level turn. **DATE** 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
G.	PREPARES FOR ROLL OUT Visual-Pitch att: constant Bank att: constant Landmarks Aural-Normal aircraft sound Control-Neutral aileron, stabilator & rudder pressure Motion-Constant positive G, pitch & roll constant	Anticipates roll out to level flight Sustains turn	Maintains required aileron, stabilator & rudder control
H.	STARTS ROLL OUT Visual-Pitch att: constant Bank att: constant Landmarks Aural-Normal aircraft sound Control-Aileron, stabilator & rudder pressure Motion-Constant positive G, pitch & roll constant	Determines position to roll out to level flight	Coordinates aileron & rudder and relaxes stabilator pressure
I.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: roll Landmarks Aural-Chg. in aircraft sound Control-Increased aileron, stabilator & rudder pressure Motion-Decreasing positive G, pitch decreasing, rolling	Determines satisfactory roll rate & need to decrease power	Maintains coordinated aileron & rudder pressure, reduced stabilator pressure, adjusts throttle

SITUATION Aircraft straight and level at cruise power and trimmed.

TASK NO. 01 **TASK** 90° level VFR turn **AIRCRAFT** General

TASK GOAL Roll in 45° - 60° bank and roll out to perform a 90° level turn. **DATE** 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
J.	STOPS ROLL Visual-Pitch att: decreasing Bank att: rolling Landmarks Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, reduced stabilator pressure, throttle decrease Motion-Decreasing positive G, pitch decreasing, rolling	Determines level attitude achieved	Moves aileron & stabilator, relaxes rudder pressure
K.	ESTABLISHES LEVEL FLIGHT Visual-Pitch att: level Bank att: level Landmarks Aural-Normal aircraft sound Control-Neutral aileron & rudder, constant stabilator pressure Motion-Normal G	Sustains level flight	Maintains required aileron, stabilator & rudder control

TACTICAL MANEUVER TASK SELECTION

Of major interest and concern in this research effort was the selection of representative air-to air and air-to-ground tactical flying tasks to be utilized in the taxonomic data base. However, before the candidate list could be developed, it was necessary to select an aircraft which had both acceptable air-to-air and air-to-ground capabilities. Once the aircraft was selected, an appropriate list could be developed.

After consideration by the contractor, with the valuable assistance from members of the Luke AFB Instructional Systems Development (ISD) team, the McDonnell Douglas F-4E was chosen as the subject aircraft for this study. The F-4E has good air-to-air and air-to-ground capabilities in addition to a considerable base of pilot experience. With this agreement, a process of selecting the representative flying tasks was begun.

The first step was to establish a set of criteria to facilitate selection. The following criteria were agreed upon by the contractor and the ISD team.

1. An equal number of air-to-air and air-to-ground tasks should be considered.
2. The tasks should address as many flying problem areas as possible.
3. The tasks should be flying oriented instead of system oriented and characterize the delivery of as many different types of weapons as possible.
4. The tasks shouldbe of sufficient length and complexity to develop an analysis system which later could be used to analyze all air combat maneuvering (ACM) tasks.

With the selection criteria established, a computerized list of candidate F-4 flying tasks was provided by the USAF upon which to apply these criteria. Table 5 shows the representative tactical flying tasks selected by the contractor and approved by the Luke AFB ISD team. The list of sixteen representative tactical flying maneuvers fulfilled all of the stated criteria.

Table 5. Representative Tactical Flying Maneuvers

Air-to-Air Intercept

Task 1. Single Turn Commit
Task 2. Reattack with Convert to Stern

Conventional Air-to-Ground Delivery

Task 1. High Angle Dive Bomb (Day)
Task 2. Low Angle Dive Bomb (Day)
Task 3. Dive Toss - High (Day)
Task 4. Low Angle Strafe (Day)
Task 5. Low Angle Rocket (Day)

Nuclear Air-to-Ground Delivery

Task 1. Low Angle Drogue Delivery (LADD)

Air-to-Air DART

Task 1. DART (Racetrack Pattern)

Tactical Air-to-Ground Delivery

Task 1. Pop-Up Delivery

Air-to-Air ACM (one on one)

Task 1. High Yo-Yo
Task 2. Counter High Yo-Yo
Task 3. Reversal
Task 4. Counter Reversal
Task 5. Low Yo-Yo
Task 6. Counter Low Yo-Yo

FIELD STUDY OF THE REPRESENTATIVE FLYING TASKS

A field study was undertaken to obtain as much real-world input as possible about each of the selected representative flying tasks. This was accomplished by recording interviews with operational F-4 crewmen and graphically delineating each task at the 334th and 336th squadrons, Seymour Johnson AFB, North Carolina.

Interview Procedures - It was important that the interviews be carefully structured so that the depth of detail would be consistent and accurate. It shoud be pointed out that accuracy of the surface analysis, and thus the entire taxonomic data, depended upon getting as much detailed information as possible from the field study. In order to do this, the interviewer who was also a pilot became familiar with each maneuver to be discussed by becoming acquainted with available USAF manuals on basic fighter maneuvers. Prior study was also made of pertinent parts of the technical manuals for the F-4D and F-4E aircraft.

To insure that the same introductory information would be given to all aircrew personnel, a general introduction lasting about three minutes was tape recorded ahead of time by the interviewer. This introduction essentially set the stage for the interview process. A checklist was also prepared beforehand so that the interviews would proceed in an orderly fashion, and no pertinent data would be left out. The following is the checklist developed for this field study.

Pre-Taping Session

1. Play short taped introduction (3 minutes).
2. Select maneuver to be examined.
3. Obtain from the interviewee a graphic description of the maneuver, i.e., a picture of what it looks like performed in space.
4. Delineate specific key points (element sequences) on the picture for details such as altitude, airspeed, communication (including essential inputs from the second crew member), weapons selection, details on sight picture, and/or radar display presentation.
5. Review switch and knob system functions using a cockpit layout.
6. Question crew members so as to expand the description of the maneuver before taping.

Taping

1. Verbally identify the maneuver diagram as described in the pre-taping session.
2. Obtain background and experience about interviewee:
   - Time in squadron
   - F-4E experience
   - Total flying time
   - Combat experience (if any)

After the introductory recording, the representative task was talked through first by two pilots or by a pilot and a Weapons Systems Officer (WSO), as the task required. Much use was made of diagrams of the flight path of the task, and notes were written by the interviewer or participating aircrews on these diagrams. Figure 7 shows an example of one of these diagrams. It can be noted that significant points and positions were described on the diagram along with specific tasks which needed to be accomplished as part of the maneuver. Disagreement on technique sometimes arose between pilots or WSOs; however, these were resolved by the interviewer and participants. When the tactical approaches were fully discussed, "one good way" was agreed upon.

The initial discussion and diagrammatic detailing for each task lasted from 25 to 45 minutes. When this was completed, the recorder was turned on, and the task was discussed from notes on the diagram. Specific action points on the flight path were explained or expanded. The actual taped interviews lasted 10 to 15 minutes. These short concise recordings and accompanying diagrams proved to be an ideal format from which to prepare the required surface analysis data base.

Approximately 35 pilots and WSOs were interviewed during 1 week, using two working tactical squadrons. It was not always possible to interview two crew members at the same time, so an agreement technique was used whereby one or two pilots reviewed the maneuver diagram and listened to the tape of the other. In all cases when the starting situations and ending goals were carefully explained, the critiquing pilots agreed that the events detailed by their peers were at least "one good way" to accomplish the maneuver. This general agreement between several pilots was unique because it tended to blunt the often expressed idea that "you can ask fighter pilots the same question and get a different answer from every one of them." It was noted that if the situation was carefully explained and the original inputs were made by qualified pilots, their responses had a high level of agreement.

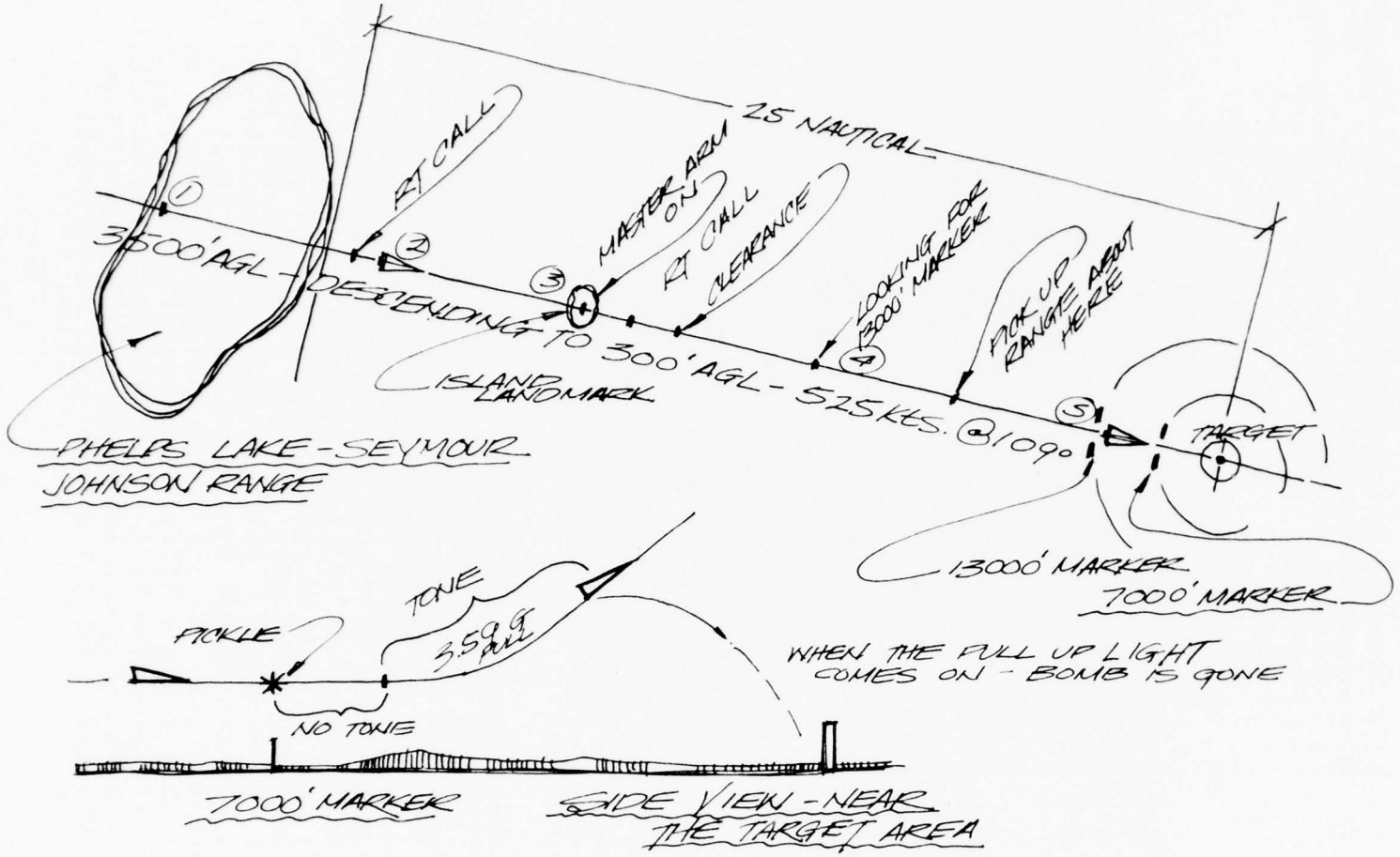


Figure 7. Nuclear low angle drogue delivery maneuver diagram.

The maneuver diagrams and taped interview data were used to generate an initial surface task analysis for each of the representative tasks. Researchers were careful to build their task element sequences around the key action points described by squadron pilots and weapons systems officers. By carefully describing the flying behavior, even in the initial phase, it was felt that verification of these analyses would be a less difficult matter.

Interview techniques were again used to verify the initial surface task analyses. Aircrews who had participated in the data collection phase of the field study were asked to comment and make corrections to the analyses. The task diagrams and taped interviews were reviewed and the surface analysis format and system were carefully explained to these air crewmen. The maneuver diagram, which was prepared for each representative task and showed the position and attitude of the aircraft for each task sequence, proved to be an important aid to flying personnel in grasping the analysis format and system.

These flying personnel made numerous corrections to each of the surface analyses. All of the initial analyses remained basically intact except for the Reattack maneuver, in which researchers had missed a number of important points. This task was completely revised at Seymour Johnson AFB with the help of the participating pilots and WSOs. This task was then rechecked until it was found to be satisfactory.

USERS MANUAL FOR THE PERFORMANCE OF SURFACE TASK ANALYSES

Up to this point, only the background and terminology used in the surface task analysis have been discussed. This section will present a sample exercise in a user oriented format that will provide step-by-step instructions in performing a surface analysis for those not familiar with analysis techniques. It is suggested that the analysis developer be a pilot and have a specific knowledge of the aircraft and aircraft systems being described in the analysis.

Format Fundamentals - Since the surface analysis was developed for use within a taxonomic or classification structure, it was important that the maneuvers to be analyzed begin at a relatively constant state of flying activity. All task maneuvers in this report, for example, are started with the aircraft in level flight or a constant rate turn. As part of this planning, a detailed scenario should be developed which identifies all of the following areas:

1. The kind or kinds of aircraft involved.
2. The type of maneuver and weapons delivery to be involved.
3. Whether it is to be a range or tactically oriented maneuver environment.
4. Consideration of the flight path or paths of the aircraft.
5. The starting situation of the aircraft and the specified task goal.

The information regarding these five points should be as factual as possible. It should be understood that even at best, a paper analysis is extremely limited in its dynamic capability. However, the more real-world the inputs, the closer the somewhat static paper description will resemble a real situation.

The first step in performing a surface task analysis is to prepare a diagram of the maneuver. The diagram should graphically describe the flight path of the aircraft as the maneuver is performed in space. Figure 7 shows the minimum level of detail for an initial maneuver diagram. This step will help organize the analysis element sequences. Action points should be intuitively added to indicate where the major task sequences will eventually be detailed in the written analysis. Figure 8 describes a Loop maneuver with the action points intuitively placed as A, B, C, etc. This Loop maneuver will be used as the example throughout the user format description.

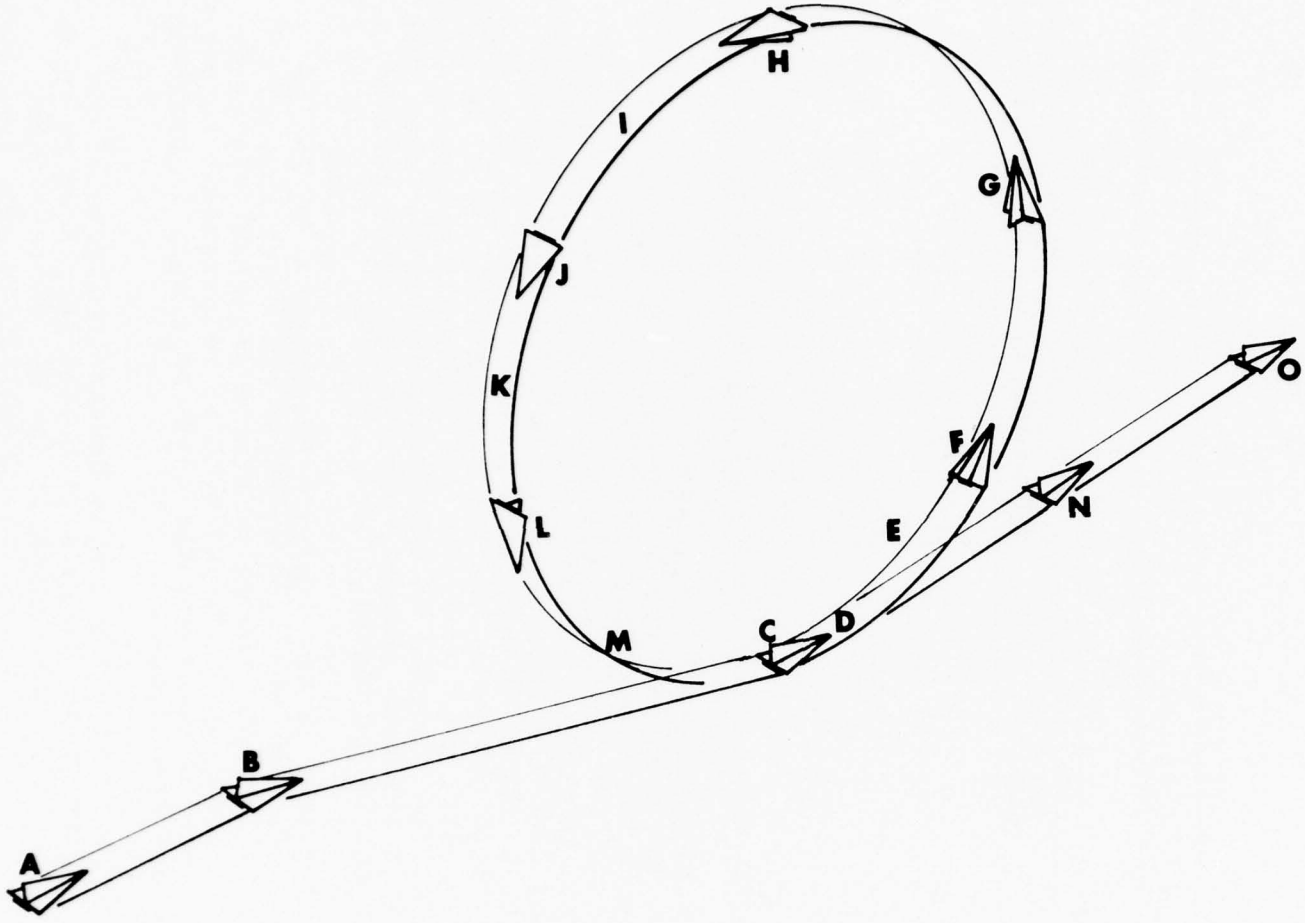


Figure 8. Loop maneuver diagram.

Completion of the Data Blocks - Before the analysis is started, the data blocks at the top of the format shown in Figure 9 should be completed.

SITUATION _____

TASK NO. _____ TASK _____ AIRCRAFT _____

TASK GOAL _____ DATE _____

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION

Figure 9. Surface task analysis data blocks.

The situation statement should briefly describe the state of the aircraft at the place or point where the analysis is to be started. It should include such items as attitude, position (as over a section line), straight and level, airspeed, systems setup, and any other pertinent data that describe the state of the aircraft. A number should be assigned to each task as well as a name describing what is to be performed and the type of aircraft to be used. Finally, a task goal should be defined which determines at what point the analysis is considered complete. When this information has been entered, work on the first element sequence can be initiated.

Performance of the Analysis Sequences - Figure 10 shows the start of the Loop maneuver and shows how each cues, mental action, and motor action sequence relates to the Loop diagram and also shows their relationship to one another. Listed below are the steps necessary to complete each element sequence.

1. First study the Sample Surface Analysis of the Loop in Figure 10 and compare it to the Loop diagram in Figure 8. Notice that action of the EL. SEQ. (Element Sequence) A - BEGINS PRE-ENTRY ACCELERATION, goes from left to right and from one Element Sequence to another as shown by the line overlay. Each 1-2-3 element sequence may be

SITUATION Aircraft positioned on section line, straight & level flight

TASK NO. 02 TASK Straight & level/transition thru a loop AIRCRAFT General

TASK GOAL To perform a 360° turn in the vertical plane DATE 1977

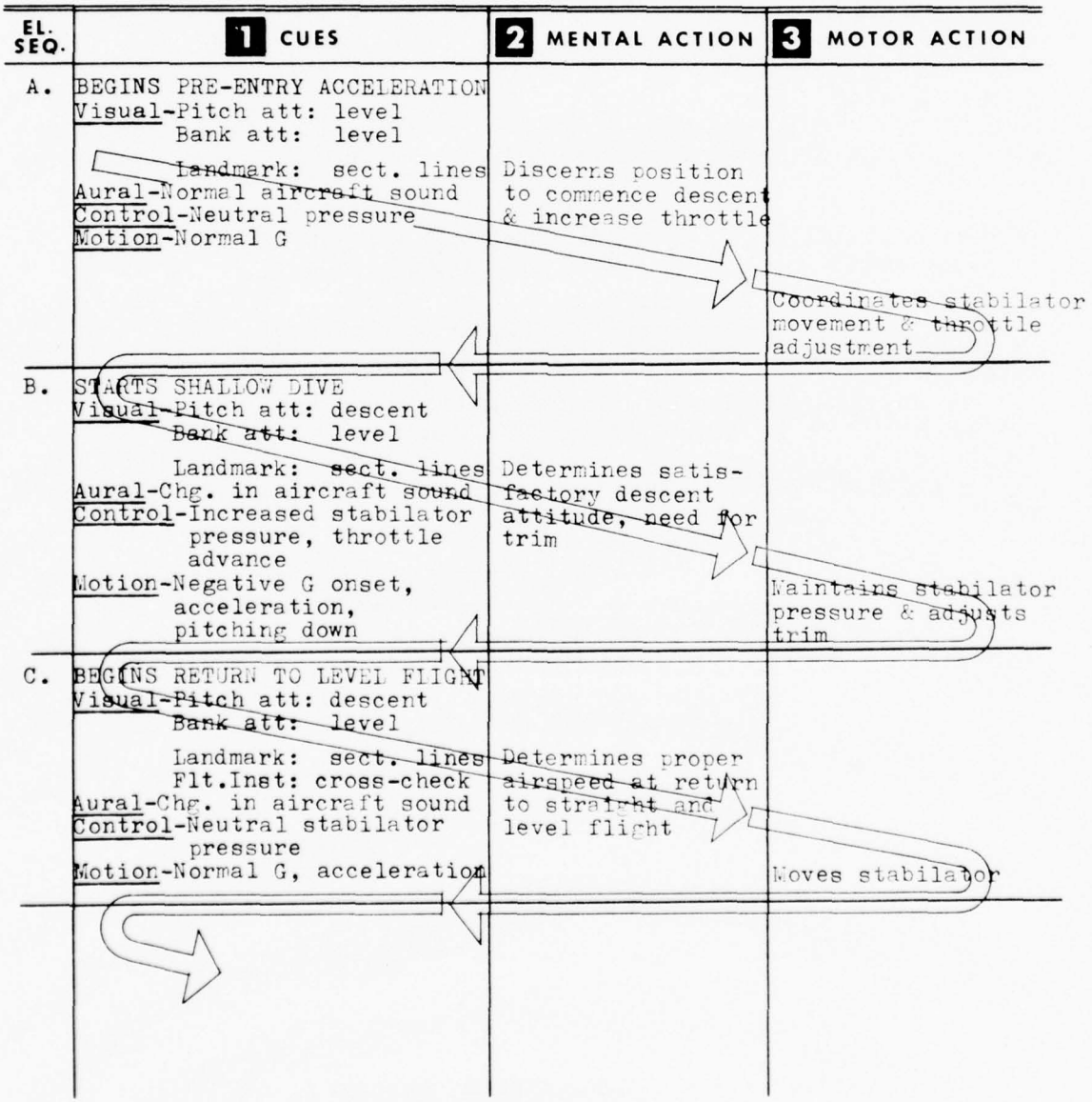


Figure 10. Sample surface analysis.

thought of as a single frame of a motion picture film. Taken separately, each "frame" or sequence is static; however, when taken as a flow of events, it becomes a dynamic part of the entire task.

2. Notice that the cues in sequence A show a stable aircraft in level flight. A mental process begins the action and a resulting motor action carries out the aircraft control. Because of the pilot's motor or control action, a new set of cues has resulted for the various visual, aural, control, and motion cue categories. Consequently, new mental actions are required to process these cues, and a new motor action is the result. This rhythmic flow line is constant throughout all flight tasks and is the essential key to the thought process you must develop to successfully complete a surface analysis.

3. Review again the flight diagram, the analysis sequences, and the rules and instructions in the first section until they are completely understood.

4. Element sequences A, B, and C will now be discussed in detail so that you can understand the rationale for each category entry. A complete understanding of the cues, mental action, and motor action categories will facilitate the generation of the surface analyses. Each element sequence has been given a descriptive title. "BEGINS PRE-ENTRY ACCELERATION" describes the performance characteristics of the sequence. See Figure 11.

EL. SEQ.	1 CUES
A.	BEGINS PRE-ENTRY ACCELERATION Visual-Pitch att: level Bank att: level Landmark:section line Aural-Normal aircraft sound Control-Neutral pressure Motion-Normal G

Figure 11. Sample cues category.

Visual - The aircraft enters the Loop from level cruise flight; consequently, pitch and bank attitudes are straight and level. A long straight outside reference is used for best performance of this task. This cue is called out as a section line.

Aural - The aircraft enters the task from a constant or steady-state; therefore, audible cues are normal aircraft sounds.

Control - The aircraft is trimmed for cruise; therefore, all control forces are considered as neutral pressure.

Motion - Since motion cues refer to gravity or centrifugal forces on the body, and the flight prior to task entry is straight and level, normal G (+1 G) is listed.

With the completion of the cues category, the analysis can progress to the mental action category. This category is, at best, only an approximation of the actual mental processes which take place during a flying task. Hence, mental actions are derived from cues inputs and performance requirements needed to put the aircraft in the proper flight path for a specific task. Figure 12 shows that the pilot discerns the position to start his descent in order to increase airspeed and actually begin the maneuver. Discerns was selected as the mental process because the cognitive description associates it with the perception of a specific cue. Increased throttle is associated with the quickest way of increasing airspeed.

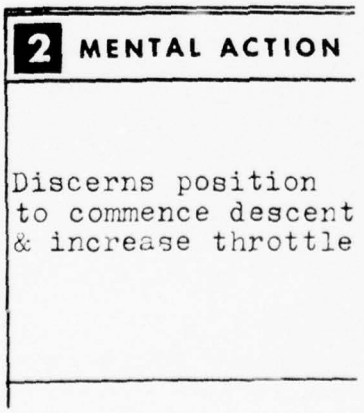


Figure 12. Sample mental action category.

The chain of events, thus far, shows the cues conveying the aircraft state to the pilot. The mental action has been a response to the state or position of the aircraft in space relative to the maneuver to be performed. The next link is the motor action produced by the preceding cues and mental actions.

Figure 13 describes the initial step in changing the attitude of the aircraft at the start of the descent. This step is the movement of the flight controls to change the pitch of the aircraft and increase the throttle. These two motor actions are the result of the two previous actions, i. e., cues and mental action.

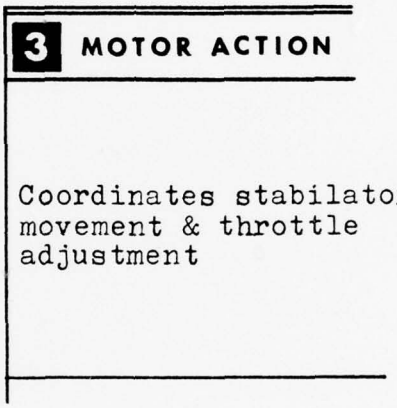


Figure 13. Sample motor action category.

This completes element sequence A. It is important to note that the motor action description has been kept brief in order to reduce the number of small motor actions that are normally performed when executing even the smallest part or segment of a maneuver. Therefore, for analysis purposes the pilot performance is always considered "perfect."

The analysis now flows to the next chain of events or element sequence which is a product of the preceding sequence.

Figure 14 describes the performance characteristics of element sequence B, "STARTS SHALLOW DIVE." This is the result of stabilator movement and throttle increase in the motor action category in sequence A. With this action having taken place, there is also a corresponding change in the cues.

EL. SEQ.	1 CUES
B.	STARTS SHALLOW DIVE Visual-Pitch att: descent Bank att: level Landmark:section line Aural-Chg. in aircraft sound Control-Increased stabilator pressure Motion-Negative G onset, acceleration, pitching down

Figure 14. Sample cues category.

Visual - The pitch attitude in the visual cues changes from "level" to "descent." Since no turn has been initiated, the bank attitude is still "level," and the section line remains part of the visual cues since it is still used for reference.

Aural - The aural cue is described as "change in aircraft sound" because airspeed is beginning to increase and engine speed is increasing.

Control - The control cue also changes from "normal" to "increased stabilator pressure" because the pilot has pushed forward on the control stick.

Motion - The motion cue is described as "negative G onset, acceleration, and pitching down" because the forward control stick movement has caused these changes in the motion cues and the pilot is experiencing them through his body.

This change in cues has a corresponding effect on the mental action category in the "B" element sequence. Because of these cue changes, a determination or decision must be made whether the new cues condition indicates that the new element sequence (STARTS SHALLOW DIVE) has been achieved.

Figure 15 shows the mental action description, "Determines satisfactory descent attitude." This describes the action because there is multiple-cue processing involved. The reference "need for trim" is made because good trim techniques are considered important in the performance of a well executed maneuver.

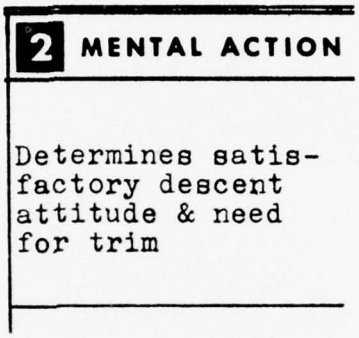


Figure 15. Sample mental action category.

Figure 16 describes the pilot maintaining his control stick pressure because the trimming motor action has not yet taken place. Trimming action is described as "adjusts trim" because this action is considered as an incremental regulation of a specific control. The results of this trimming action will be described in the next element sequence control cues description.

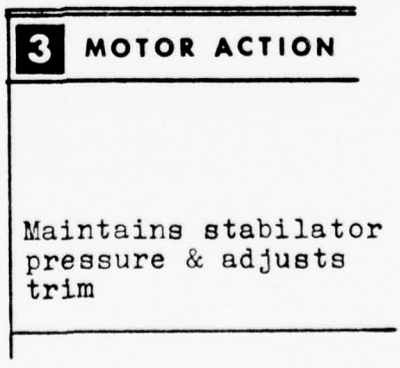


Figure 16. Sample motor action category.

Before the next element sequence is analyzed, note that a systematic reference to the maneuver diagram assists in keeping a mental picture of what specifically is occurring. The purpose of the first two sequences was to achieve entry airspeed into a Loop maneuver. Since the aircraft is now in a shallow dive and accelerating, the next logical sequence is to begin to return to level flight and continue with the maneuver.

Element sequence C is titled, "BEGINS RETURN TO LEVEL FLIGHT." Note that this description follows the appearance of the performance characteristic shown in the Loop diagram, Figure 8.

EL. SEQ.	1 CUES
C.	BEGINS RETURN TO LEVEL FLIGHT Visual-Pitch att: descent Bank att: level Landmark:section line Flt.Instr:cross-check Aural-Chg. in aircraft sound Control-Neutral aileron, rudder & stabilator pressure Motion-Normal G,acceleration

Figure 17. Sample cues category.

Visual - The visual cues have not changed because the previous motor action maintained the control position and so did not affect the pitch or bank attitude of the aircraft. The section line cue remains because it is used as an outside world cue. A new cue, "Flight Instrument: Cross-check" appears because a certain airspeed is desired to enter the Loop.

Aural - The aural cue, "Change in aircraft sound," remains because the aircraft continues to increase airspeed.

Control - The control cue is now described as "neutral stabilator" because the motor action in the previous sequence trimmed off the excess control pressure.

Motion - The motion cue is described as "normal G" because the descent attitude has been established. "Acceleration" is noted because the aircraft is continuing to accelerate in its descent attitude.

The mental action category shown in Figure 18 describes the process as "Determines proper airspeed and need to return to straight and level flight." This mental action processes the return of most cues to a near constant condition and a cross-check of flight instruments ascertains correct performance requirements for a return to level flight.

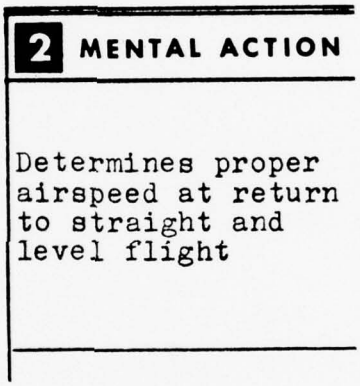


Figure 18. Sample mental action category.

The action in Figure 19 describes the motor action associated with the preceding mental process - "Moves (pulls back) stabilator."

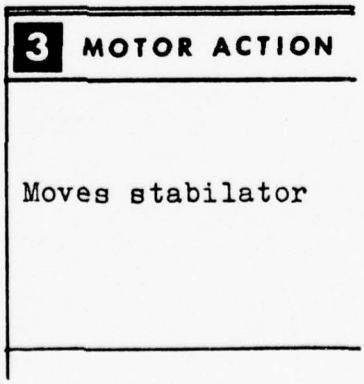


Figure 19. Sample motor action category.

5. Now try to complete the Loop maneuver on your own. Review the Loop diagram and the Rationale for Surface Task Analysis Sequences in the first section. Then get started writing sequences. All the action points for this task have been completed. When you have completed the Loop, compare your sequences to the completed example beginning on page 44, Figure 20.

6. At this point, having done one analysis, you have made an important beginning. If you found it difficult, don't be discouraged. Remember that it took an expert researcher 10 hours to analyze the Loop used as the example. Additional time was also needed to refine and perfect the sequences.

7. Remembering all the details was one of the problems in applying the rules and instructions for the surface task analysis. This problem was resolved by compiling the most pertinent data in the format shown in Figure 21. Rules and instructions have been excerpted into clearly defined cues, mental action, and motor action categories.

It is obvious that these step-by-step instructions for the completion of the surface task analysis will not make the novice developer an instant expert. An experienced fighter pilot, but one naive in analysis techniques, was given these rules and instructions and asked to read them and perform the analysis as directed. However, he was able to do a remarkably good job on the first try with no additional coaching from researchers. The key, as he expressed it, was to read the material over carefully several times and then start writing sequences, leaving the refinements until later.

SITUATION Aircraft on section line, straight and level at cruise power.

TASK NO. Ct-1 TASK Straight and level/ transition thru a Loop AIRCRAFT T-37

TASK GOAL To perform a 360° turn in the vertical plane DATE April, 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	BEGINS PRE-ENTRY ACCELERATION Visual-Pitch att: level Bank att: level Landmark:section lines Aural-Normal aircraft sound Control-Neutral pressure Motion-Normal G	Discerns position to commence descent and increase throttle	Coordinates elevator movement and throttle adjustment
B.	STARTS SHALLOW DIVE Visual-Pitch att: descent Bank att: level Landmark:section lines Aural-Chg. in aircraft sound Control-Increased elevator pressure and throttle advance Motion-Negative G onset, acceleration, pitching down	Determines satisf. descent attitude & need for trim	Maintains elevator pressure and adjusts trim
C.	BEGINS RETURN TO LEVEL FLIGHT Visual-Pitch att: descent Bank att: level Landmark:section lines Flt.Instr:cross-check Aural-Chg. in aircraft sound Control-Neutral elevator pressure Motion-Normal G, acceleration	Determines proper airspeed at return to straight & level flight	Moves elevator
D.	PREPARES PULL-UP Visual-Pitch att: level Bank att: level Landmark:section lines Aural-Normal aircraft sound Control-Increased elevator pressure Motion-Normal G	Anticipates constant back pressure to maintain constant nose movement Sustains flight	Maintains required aileron, elevator & rudder control
E.	STARTS PULL-UP Visual-Pitch att: level Bank att: level Outside ref: horizon Flt.Instr:cross-check Aural-Normal aircraft sound Control-aileron, elevator & rudder pressure Motion-Normal G	Determines position to begin smooth pull	Increases elevator pressure

Figure 20. Loop surface task analysis. (Pages 44-46)

SITUATION Aircraft on section line, straight and level at cruise power.

TASK NO. Ct-1 TASK Straight and level/ transition thru a Loop AIRCRAFT T-37

TASK GOAL To perform a 360° turn in the vertical plane DATE April, 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
F.	CONTINUES PULL-UP Visual-Pitch att: increasing Bank att: level Outside ref: horizon Aural-Chg. in aircraft sound Control-Increased elevator pressure Motion-Positive G onset, pitching up	Determines satisf. rate of nose movement & desired seat pressure	Maintains aileron position & increases elevator pressure
G.	CONTINUES PULL-UP TO VERTICAL Visual-Pitch att: increasing Bank att: level Outside ref: horizon Aural-Chg. in aircraft sound Control-Neutral ailéron pressure, increased elevator pressure Motion-Constant positive G, pitching up	Determines nose reaching vertical	Relaxes elevator pressure
H.	CONTINUES OVER THE TOP (INVERTED) Visual-Pitch att: level Bank att: level Outside ref: horizon Flt.Instr:cross-check Aural-Chg. in aircraft sound Control-Decreased elevator pressure Motion-Decreased positive G, pitching	Determines satisf. rate of nose movement and seat pressure	Increases elevator pressure
I.	CONTINUES DOWN THE BACK SIDE (INVERTED) Visual-Pitch att: decreasing Bank att: level Outside ref: horizon Aural-Chg. in aircraft sound Control-Increased elevator pressure Motion-Increased positive G, pitching down	Discerns nose passing thru horizon	Relaxes elevator pressure (slightly)
J.	CONTINUES INTO DIVE (INVERTED) Visual-Pitch att: decreasing Bank att: level Outside ref: horizon Aural-Chg. in aircraft sound Control-Decreased elevator pressure Motion-Decreasing positive G, pitching down	Determines need for constant seat pressure	Increases elevator pressure

SITUATION Aircraft on section line, straight and level at cruise power.

TASK NO. Ct-1 TASK Straight and level/ transition thru a Loop AIRCRAFT T-37

TASK GOAL To perform a 360° turn in the vertical plane DATE April, 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
K.	CONTINUES PULL-DOWN TO VERTICAL Visual-Pitch att: decreasing Bank att: level Landmark:section lines Aural-Chg. in aircraft sound Control-Increased elevator pressure Motion-Constant positive G, pitching down, acceleration	Determines satisf. nose position, rate of movement & seat pressure	Maintains coordinated elevator, aileron and rudder pressure
L.	STARTS PULLOUT OF DIVE Visual-Pitch att: decreasing Bank att: level Landmark:section lines Flt.Instr:cross-check Aural-Chg. in aircraft sound Control-Aileron, elevator & rudder pressure Motion-Constant positive G, pitching down, acceleration	Determines satisf. rate of attitude change	Maintains constant elevator pressure
M.	CONTINUES PULLOUT Visual-Pitch att: increasing Bank att: level Landmark:section lines Aural-Chg. in aircraft sound Control-Constant elevator pressure Motion-Constant positive G, pitching up, acceleration	Determines level flight approaching	Relaxes elevator pressure
N.	STOPS PULLOUT Visual-Pitch att: increasing Bank att: level Landmark:section lines Aural-Chg. in aircraft sound Control-Decreased elevator pressure Motion-Decreasing positive G, pitching up	Determines position to transition to straight and level	Coordinates aileron and rudder, adjusts elevator pressure
O.	ESTABLISHES LEVEL FLIGHT Visual-Pitch att: level Bank att: level Landmark:section lines Aural-Normal aircraft sound Control-Increased aileron, rudder & elevator pressure Motion-Normal G	Determines level flight achieved & need for trim	Activates trim & releases elevator pressure

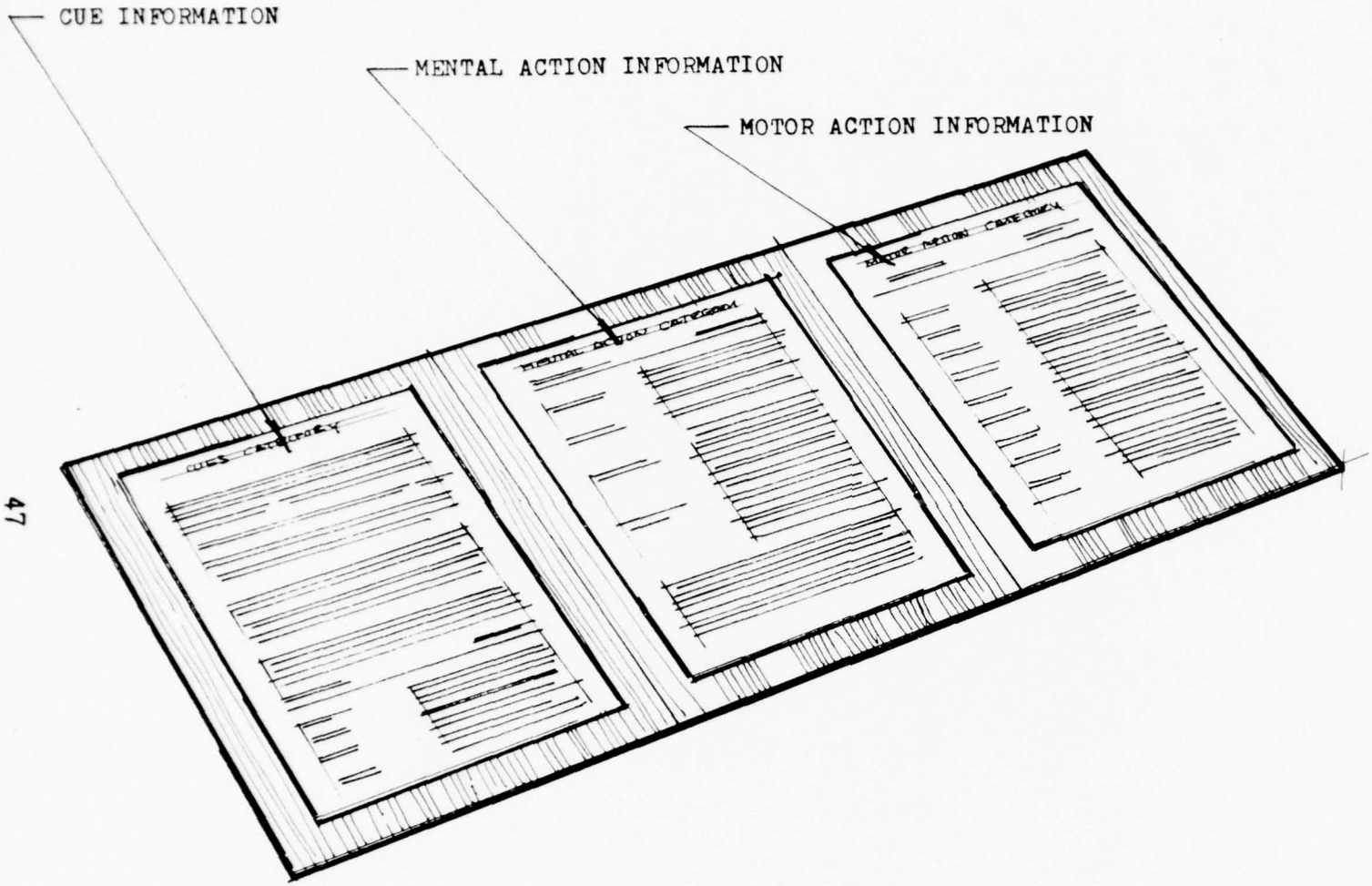


Figure 21. Excerpted rules and instructions format.

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GLOSSARY

Attitude - the position of the aircraft considering the inclination of its axis in relation to the horizon.

Aural - cues or stimuli which can be sensed through hearing.

Bank - to tip, or roll about the longitudinal axis of the aircraft. (Banks are incidental to all properly executed turns.)

Climb - a state of flight in which the aircraft is increasing in altitude.

Control - a device used by a pilot in operating an airplane.

Control Feedback - cues or stimuli which can be sensed by body limbs or extremities through the control devices of the aircraft. The control feedback input has been shortened to Control in the cues column of the surface analysis.

Coordinate - the movement or use of two or more controls in their proper relationship to obtain a desired effect.

Cue - environmental or system stimuli which excite the sensory systems of the human body.

Descend - a state of flight in which the aircraft is decreasing in altitude.

Effector Output - pilot motor action in terms of control exerted on the aircraft, (i.e., stabilator movement resulting from control stick movement to change aircraft pitch attitude).

Long Term Memory - information which was acquired prior to the performance of the skill.

Maneuver - any planned motion of the aircraft in the air or on the ground.

Maneuver Diagram - the sketch of a flying task which depicts the flight path of the aircraft, and shows specific action points along this path.

Mental Action - cognitive process initiated by perceived stimulus cues and preceding motor actions.

Motion - cues or stimuli which can be sensed by the body receptors as a result of aircraft movement.

Motor Action - those physical actions resulting in movement of aircraft controls.

Pickle Button - a pilots' expression of the push button used to release ordnance such as bombs or rockets.

Pinkie Switch - switch activated by the little finger which changes the armament mode on the F-4E.

Pitch - the angular displacement of the longitudinal axis of the aircraft with respect to the horizon.

Roll - displacement around the longitudinal axis of the aircraft.

Short Term Memory - information remembered which was obtained during the performance of a skill.

Straight and Level - a state of flight in which the aircraft is in a constant heading at a constant altitude with wings in the same plane as the horizon.

Surface Task Analysis - the investigative process which systematically lists the related task elements in sequence, which results in the accomplishment of a specific task when performed in order.

Tactual - pertaining to the sense of touch.

Task - a group of related work elements performed in close temporal proximity by one person and directed toward the accomplishment of a definable goal.

Task Element - the smallest part of the surface analysis which is expressed as a major input or action heading, i.e., Cues or Mental Actions or Motor Actions are task elements of the analysis.

Task Sequence - a complete set of interacting behavioral elements, (i.e., Cues, Mental Action, and Motor Action) found in the surface analysis.

Taxonomy - a manner of classifying, and the rules and principles concerned with classification of phenomena in such a way that a more useful relationship can be established among them.

Turn - to create a change of direction of flight by causing the aircraft to roll about its longitudinal axis.

Visual - cues or stimuli which can be sensed by the eye.

APPENDIX A

THE COMPLETED ANALYSES OF THE SIXTEEN REPRESENTATIVE TASKS

THE COMPLETED ANALYSES OF THE SIXTEEN REPRESENTATIVE TASKS

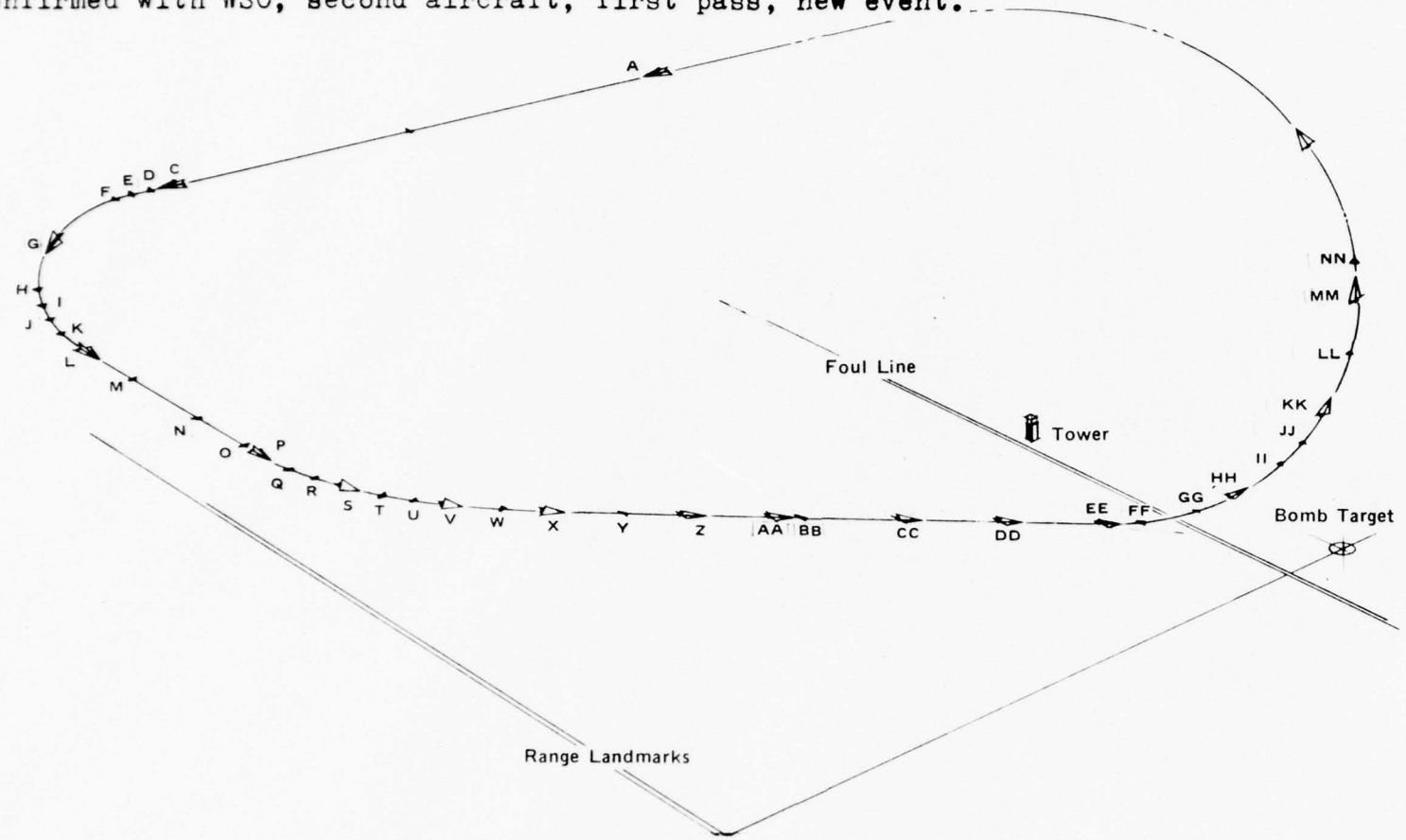
The analysis for these representative tasks formed the data base for the entire taxonomy classification. These representative tasks have been divided into air-to-air tasks and air-to-ground tasks. Each task has been coded for use in the taxonomy. As an example CR-1g is the alpha-numeric code for the High Angle Dive Bomb task. The letters "CR" designate it as a controlled range task. It is the first task in the air-to-ground group and the "g" identifies it as an air-to-ground task. Air-to-air tasks have a similar system with an "a" identifying it as an air-to-air task.

It should also be noted that each task has its own maneuver diagram to help even the experienced researcher visualize the task sequences with more dynamic realism. In the air-to-air tasks, the maneuver is done in relationship to adversary aircraft. In six of the nine air-to-air tasks, the adversary's task has also been analyzed. For example, the High Yo-Yo is analyzed against a Counter High Yo-Yo task on a sequence for sequence basis. This was done to add a measure of realism to the analyses.

Finally, it can be noted that a coded system is shown in the motor action part of each element sequence. This is the taxonomy classification coding system which was developed in Volume II of this study. It can thus be seen that the surface analysis occupies an important place in the development of a useful taxonomic system, not only as a data base but also as a cross referencing tool for future research.

HIGH ANGLE DIVE BOMB DELIVERY/Controlled Range

SITUATION - Established on downwind, straight and level, 13,000 feet AGL, 350 kts., weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.



High angle dive bomb maneuver diagram.

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED ON DOWNWIND LEG TO TARGET Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines proper spacing with desired Alt. & A/S approaching Sustains level flight	CR-1g / A / 287 1 C: VC; 2 Me: MC (I); 3 Mo: A QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: Ai/St INPUT INDEX: 45; I/O INPUT: 90; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
B.	CONTINUES ON DOWNWIND LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Eng.Inst: check fuel Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines base leg roll in position to achieve required dive angle & 11,000' distance from target, need to stabilize airspeed	CR1g / B / 277 1 C: VC; 2 Me: MC; 3 Mo: A QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: Th/St INPUT INDEX: 50; I/O INPUT: 100; OUTPUT INDEX: V-2 Adjusts throttle and maintains stabilator pressure
C.	PREPARES FOR TURN TO BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound, communication (lead calls in on final) Control-Constant stabilator pressure, throttle decrease Motion-Normal G	Anticipates roll in to base leg turn, discerns leading aircraft's communication Sustains level flight	CR-1g / C / 332 1 C: VA C; 2 Me: MC (I); 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai/St INPUT INDEX: 45; I/O INPUT: 90; OUTPUT INDEX: V-2 Maintains required aileron & stabilator pressure
D.	STARTS ROLL IN TO BASE LEG TURN Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication - (lead aircraft being cleared in "hot" by range officer) Control-Aileron & stabilator pressure Motion-Normal G	Determines position to roll in to base leg, need to call position check with fuel remaining	CR1g / D / 275 1 C: VA C; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St Rd / Ds Cm INPUT INDEX: 40; I/O INPUT: 200; OUTPUT INDEX: V-5 Coordinates aileron, rudder & stabilator movement, activates mic. switch, communicates

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES ROLL IN Visual-Pitch att: increasing Bank att: roll Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound, communication Control-Increased aileron, rudder & stabilator pressure, mic. switch function Motion-Positive G onset, pitching up, rolling	Determines roll rate satisfactory & need for power	CR/g E 280 1 C: VA CM; 2 Me: MC; 3 Mo: R A-C; CP; Ai Ru / St Th 75; 375; V-5 Maintains coordinated aileron & rudder pressure, increased stabilator pressure, adjusts throttle
F.	STOPS ROLL IN Visual-Pitch att: increasing Bank att: roll Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron, increased stabilator pressure, throttle advance Motion-Increasing positive G, pitching up, rolling	Determines proper bank attitude achieved	CR-1g F 260 1 C: VA CM; 2 Me: MC; 3 Mo: A A-C; CP; Ai Ru / St 60; 300; V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
G.	ESTABLISHES TURN Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Sustains level turn	CR-1g G 372 1 C: V CM; 2 Me: I; 3 Mo: A 3-C; CP; Ai St 45; 90; V-2 Maintains required aileron & stabilator control
H.	PREPARES TO ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G constant pitch & roll	Anticipates roll out to base Sustains level turn	CR-1g H 332 1 C: V CM; 2 Me: MR (I); 3 Mo: A 3-C; CP; Ai St 50; 100; V-2 Maintains required aileron & stabilator control

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	STARTS ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch & roll	Determines position to roll out on base for spacing & to establish proper distance to target	CR-1g / I / 275 1 C: V, CM; QUANTITY 3-C; INPUT INDEX 50 2 Me: MC; DECISION PROC CP; I/O INPUT 250 3 Mo: R; MOTOR OUTPUT AI, RU/SL; OUTPUT INDEX V-5 Coordinates aileron & rudder pressure, relaxes stabilator pressure
J.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: roll Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines satisfactory roll rate & need to reduce power	CR-1g / J / 275 1 C: V, CM; QUANTITY 3-C; INPUT INDEX 55 2 Me: MC; DECISION PROC CP; I/O INPUT 275 3 Mo: R; MOTOR OUTPUT AI, RU/SL, TH; OUTPUT INDEX V-5 Maintains coordinated aileron & rudder with stabilator movement, adjusts throttle
K.	STOPS ROLL OUT Visual-Pitch att: decreasing Bank att: roll Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure with decreased stabilator pressure, throttle reduction Motion-Decreasing positive G, pitching down, rolling	Determines wings level approaching	CR-1g / K / 17 1 C: VA, CM; QUANTITY 4-C; INPUT INDEX 65 2 Me: MC; DECISION PROC SP; I/O INPUT 130 3 Mo: A; MOTOR OUTPUT AI, RU, SL; OUTPUT INDEX V-2 Moves aileron & rudder, relaxes stabilator pressure
L.	ESTABLISHES LEVEL FLIGHT ON BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, decreased stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines level flight established & need to adjust altitude & airspeed	CR-1g / L / 272 1 C: V, CM; QUANTITY 3-C; INPUT INDEX 50 2 Me: MC; DECISION PROC CP; I/O INPUT 100 3 Mo: R; MOTOR OUTPUT SL, TH; OUTPUT INDEX V-2 Decreases stabilator pressure, and adjusts throttle

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	CONTINUES BASE LEG Visual-Pitch att: decreasing Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound Control-Increased stabilator pressure, throttle reduction Motion-Pitching down	Determines proper altitude, airspeed, & spacing approaching	CR-1g M 256 1 C: VA, CM 2 Me: MC 3 Mo: A Quantity: 4-C Decision Proc: CP Motor Output: St Input Index: 65 I/O Input: 55 Output Index: V-1 Increases stabilator pressure
N.	CONTINUES ON BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Increased stabilator pressure Motion-Normal G, pitch stabilized	Determines proper altitude, airspeed, & track; and need for trim	CR-1g N 252 1 C: V, CM 2 Me: MC 3 Mo: A Quantity: 3-C Decision Proc: CP Motor Output: Tr, St Input Index: 45 I/O Input: 90 Output Index: V-2 Adjusts trim & relaxes stabilator pressure
O.	CONTINUES ON BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron, stabilator & rudder pressure, trim switch function Motion-Normal G	Determines final roll in position approaching Sustains level flight	CR-1g O 287 1 C: VC 2 Me: MC (E) 3 Mo: A Quantity: 2-C Decision Proc: CP Motor Output: Ai, St Input Index: 30 I/O Input: 60 Output Index: V-2 Maintains required aileron & stabilator control
P.	PREPARES TO TURN TO FINAL Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Anticipates roll in and dive on final Sustains level flight	CR-1g P 327 1 C: VC 2 Me: MR (I) 3 Mo: A Quantity: 2-C Decision Proc: CP Motor Output: Ai, St Input Index: 35 I/O Input: 70 Output Index: V-2 Maintains required aileron & stabilator control

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Q.	STARTS ROLL IN TO FINAL TURN Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines proper point to start roll in and need to call position to range officer	CR-1g Q 30 1 C: V C; 2 Me: MC; 3 Mo: R 2-C; SP; SA/RU/SE/Com/TH 35; 175; V-5 Coordinates aileron & rudder movement, maintains stabilator pressure, activates mic. button, communicates, moves throttle
R.	CONTINUES ROLL IN TO TURN & DIVE Visual-Pitch att: increasing Bank att: roll Target Range landmarks Aural-Chg. in aircraft sound, communication - (clearance from range officer to drop ordnance) Control-Increased aileron & rudder pressure, constant stabilator pressure, throttle advance, mic. switch function Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate	CR-1g R 279 1 C: V A C M; 2 Me: MC; 3 Mo: R 4-C; CP; SA/SE/RU 70; 280; V-4 Maintains coordinated aileron, rudder & stabilator pressure
S.	STOPS ROLL IN TO TURN Visual-Pitch att: increasing Bank att: roll Target Aural-Chg. in aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Positive G, pitching up, rolling	Determines proper bank angle achieved	CR-1g S 260 1 C: V A C M; 2 Me: MC; 3 Mo: A 4-C; CP; SA/RU/SE 50; 250; V-5 Coordinates aileron & rudder, maintains stabilator pressure

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
T.	STARTS DIVE AS HALFWAY POINT IN TURN IS REACHED Visual-Pitch att: constant Bank att: constant Target Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Increased positive G, pitch & roll stabilized	Determines halfway point in turn reached, need to let nose descend through horizon	CR-1g T 272 1 C: V, CM; 2 Me: MC; 3 Mo: R Qty: 3-C; Dec Proc: CP; Motor Output: Ai, Ri, St Input Index: 35; I/O Input: 70; Output Index: V-2 Maintains required aileron & rudder pressure, relaxes stabilator pressure
U.	ESTABLISHES DIVING TURN Visual-Pitch att: decreasing Bank att: constant Target Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure Motion-Decreased positive G, pitching down, roll stabilized	Sustains diving turn	CR-1g U 347 1 C: VA, CM; 2 Me: I; 3 Mo: R Qty: 4-C; Dec Proc: CP; Motor Output: Ai, St Input Index: 60; I/O Input: 120; Output Index: V-2 Maintains required aileron & stabilator control
V.	CONTINUES DIVING TURN Visual-Pitch att: decreasing Bank att: constant Target Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Positive G, pitching down, roll stabilized	Determines altitude/airspeed schedule is as required Sustains diving turn	CR-1g V 77 1 C: VC, AM; 2 Me: MC (I); 3 Mo: R Qty: 4-C; Dec Proc: SP; Motor Output: Ai, St Input Index: 55; I/O Input: 110; Output Index: V-2 Maintains required aileron & stabilator control
W.	PREPARES TO ROLL OUT INTO FINAL Visual-Pitch att: decreasing Bank att: constant Target Sight Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Positive G, pitching down, roll stabilized	Anticipates rolling out of turn into wings level flight with dive angle achieved (pipper 500-700' short of target with required offset) Sustains diving turn	CR-1g W 337 1 C: VA, CM; 2 Me: MR (I); 3 Mo: A Qty: 4-C; Dec Proc: CP; Motor Output: Ai, St Input Index: 50; I/O Input: 100; Output Index: V-2 Maintains required aileron & stabilator control

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
X.	STARTS ROLL OUT Visual-Pitch att: dive Bank att: constant Target Sight Aural-Chg. in aircraft sound, communication - WSO *(calls out Alt, A/S & dive angle) Control-Aileron & stabilator pressure Motion-Positive G, pitching down, roll stabilized	Determines position to start roll out to align aircraft on target	CR-1g X 224 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, St, Rv INPUT INDEX: 55; I/O INPUT: 220; OUTPUT INDEX: V-4 Coordinates aileron, rudder & stabilator
Y.	CONTINUES ROLL OUT Visual-Pitch att: dive Bank att: rolling Target Sight Aural-Chg. in aircraft sound *communication - WSO Control-Increased aileron & rudder, constant stabilator pressure Motion-Decreasing positive G, constant pitch rolling	Determines proper roll out rate, dive angle, and alignment with target	CR-1g Y 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, St, Rv, Th INPUT INDEX: 60; I/O INPUT: 300; OUTPUT INDEX: V-5 Maintains coordinated aileron, rudder & stabilator pressure; moves throttle (to idle)
Z.	STOPS ROLL OUT, MAINTAINS DIVE Visual-Pitch att: decreasing Bank att: rolling Target Sight Range landmarks Aural-Chg. in aircraft sound, *communication - WSO Control-Constant aileron, rudder & stabilator pressure, throttle decrease Motion-Decreasing positive G, pitching down, rolling	Determines wings level approaching	CR-1g Z 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, Rv, St INPUT INDEX: 70; I/O INPUT: 140; OUTPUT INDEX: V-2 Moves aileron & rudder, relaxes stabilator pressure

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
AA.	ESTABLISHES FINAL APPROACH, Visual-Pitch att: descent Bank att: level Target Sight Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound, *communication - WSO Control-Neutral aileron & rudder, reduced stabilator pressure Motion-Normal G, pitch & roll stabilized	45° DIVE ANGLE Determines proper dive angle & airspeed approaching, need to adjust trim	CR-1g AA 257 1 C: VA, C M; 2 Me: MC; 3 Mo: A QUANTITY: A-C; DECISION PROC: CP; MOTOR OUTPUT: Tr St INPUT INDEX: 55; I/O INPUT: 110; OUTPUT INDEX: V-2 Adjusts trim & relaxes stabilator pressure
BB.	PREPARES FINAL DIVE APPROACH Visual-Pitch att: constant Bank att: level Target Sight/pipper Aural-Chg. in aircraft sound, *communication - WSO Control-Neutral stabilator pressure, trim switch function Motion-Normal G	AND DELIVERY Anticipates delivery & pull up Sustains dive	CR-1g BB 332 1 C: VA C; 2 Me: MR (I); 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St INPUT INDEX: 35; I/O INPUT: 70; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
CC.	STARTS FINAL SEGMENT OF DIVE Visual-Pitch att: constant Bank att: level Target Sight/pipper Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Normal G	Determines rate of altitude decrease & pipper tracking up to target	CR-1g CC 252 1 C: VA C; 2 Me: MC; 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai Rv St INPUT INDEX: 40; I/O INPUT: 80; OUTPUT INDEX: V-2 Maintains required aileron, rudder & stabilator pressure
DD.	CONTINUES FINAL APPROACH Visual-Pitch att: constant Bank att: level Target Sight/pipper Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Determines satisfactory sight picture approaching	CR-1g DD 257 1 C: VA C; 2 Me: MC; 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St Rv INPUT INDEX: 45; I/O INPUT: 90; OUTPUT INDEX: V-2 Maintains required aileron, rudder & stabilator pressure

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g TASK High Angle Dive Bomb Delivery/ Controlled Range AIRCRAFT F-4E

TASK GOAL Perform high dive bomb on prescribed target DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
EE.	RELEASES WEAPON Visual-Pitch att: constant Bank att: level Target Sight/pipper Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Determines proper sight picture for weapon release & need to release weapon	CR-1g EE 252 1 C: VA C; 3-C; 45 2 Me: MC; CP; 90 3 Mo: A; A, R, St Ds; V-2 Maintains minimum aileron, rudder & stabilator pressure; activates bomb release
FF.	STARTS RECOVERY FROM DIVE Visual-Pitch att: constant Bank att: level Target Sight/pipper Aural-Chg. in aircraft sound Control-Aileron, rudder & stabilator pressure; weapon release switch Motion-Normal G	Determines need to effect smooth recovery (4G's within 2 seconds)	CR-1g FF 31 1 C: VA C; 3-C; 45 2 Me: MC; SP; 45 3 Mo: R; St; V-1 Moves stabilator
GG.	BEGINS 4G PULL OUT Visual-Pitch att: increasing Bank att: level Aural-Chg. in aircraft sound Control-Increased stabilator pressure, constant aileron & rudder pressure Motion-Positive G onset	Determines satisfactory pitch movement & need to increase power to full mil. as nose comes through horizon	CR-1g GG 277 1 C: VA CM; 4-C; 35 2 Me: MC; CP; 70 3 Mo: R; St / Th; V-2 Maintains stabilator pressure & moves throttle (to mil.)
HH.	ESTABLISHES 4G PULL OUT SCHEDULE Visual-Pitch att: increasing Bank att: level Leading aircraft Aural-Chg. in aircraft sound Control-Constant stabilator pressure, throttle advance Motion-Constant positive G, pitching up, acceleration	Determines 4G schedule approaching & need to establish constant schedule	CR-1g HH 36 1 C: VA CM; 4-C; 45 2 Me: MC; SP; 45 3 Mo: R; St; V-1 Maintains stabilator pressure

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-1g **TASK** High Angle Dive Bomb Delivery/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform high dive bomb on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
II.	STOPS PULL UP TO CLIMBING TURN Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant stabilator pressure Motion-Constant positive G, pitching up	Determines proper pitch achieved & need for trim	CR-1g II 17 1 C: VC, AM; 2 Me: MC; 3 Mo: A 4-C; SP; St, Tr 40; 80; V-2 Relaxes stabilator pressure, activates trim switch
JJ.	PREPARES TO TRANSITION TO CLIMBING TURN Visual-Pitch att: climb Bank att: level Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Decreased stabilator pressure, trim switch function Motion-Decreased positive G	Anticipates initiating climbing turn to downwind when nose passes 20° above horizon Sustains climb	CR1g JJ 332 1 C: VC, M; 2 Me: MR (I); 3 Mo: A 3-C; CP; Ai, St 45; 90; V-2 Maintains required aileron & stabilator control
KK.	STARTS ROLL IN TO CLIMBING TURN Visual-Pitch att: climb Bank att: level Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal positive G	Determines nose passing through 20° & need to initiate turn to downwind	CR1g KK 270 1 C: VC; 2 Me: MC; 3 Mo: R 2-C; CP; Ai, Ru, St 40; 200; V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
LL.	CONTINUES ROLL IN TO CLIMBING TURN Visual-Pitch att: increasing Bank att: roll Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder pressure, constant stabilator pressure Motion-Positive G onset, pitching up, rolling	Determines desired pitch attitude & satisfactory roll rate/turn for proper spacing	CR1g LL 255 1 C: VC, M; 2 Me: MC; 3 Mo: A 3-C; CP; Ai, Ru, St 50; 250; V-5 Maintains coordinated aileron & rudder pressure, increases stabilator pressure

SITUATION Aircraft established on downwind, straight and level, 13,000' AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.

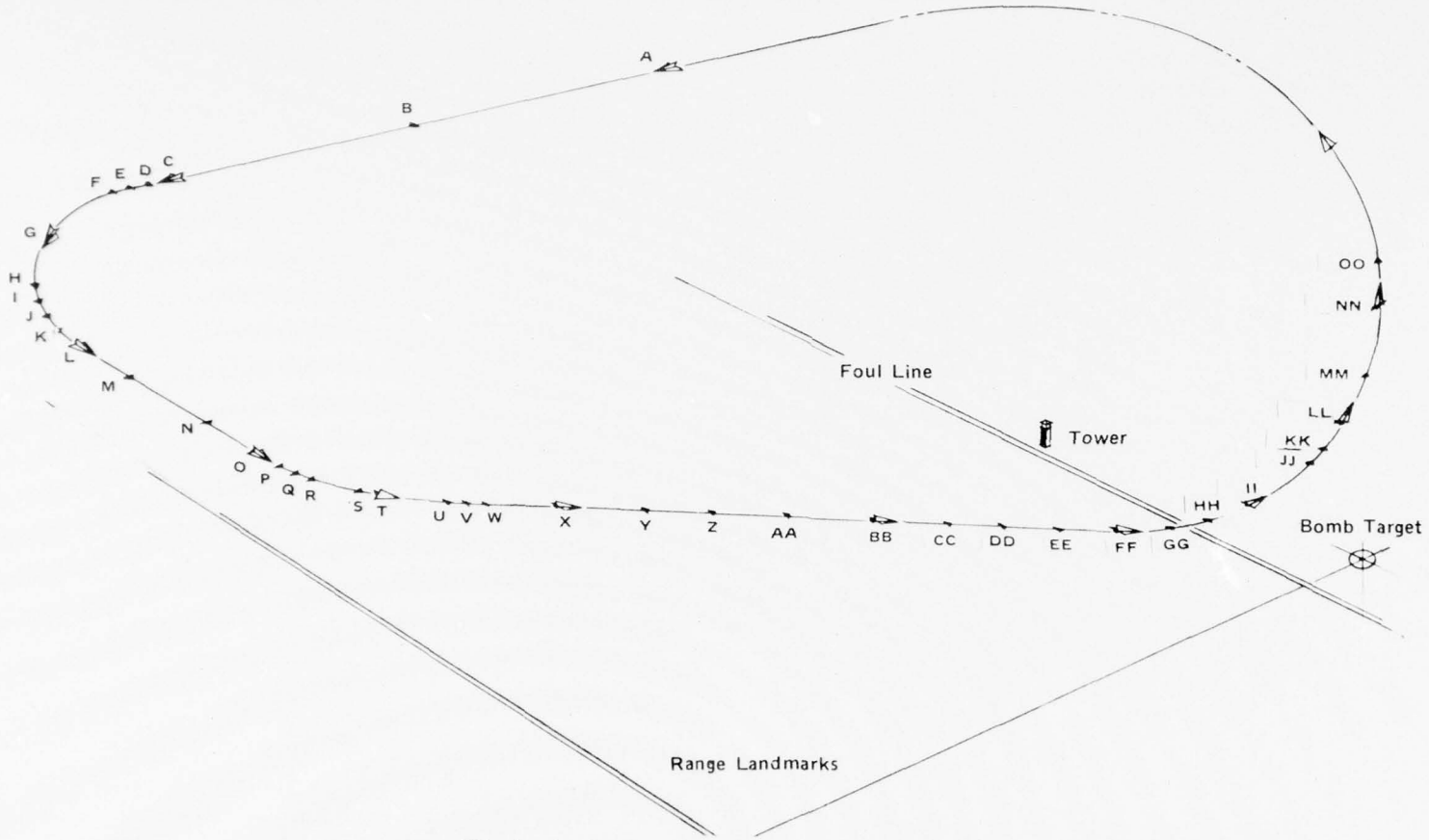
TASK NO. CR-1g TASK High Angle Dive Bomb Delivery/ Controlled Range AIRCRAFT F-4E

TASK GOAL Perform high dive bomb on prescribed target DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
MM.	STOPS ROLL IN TO CLIMBING TURN Visual-Pitch att: constant Bank att: roll Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Increased positive G, constant pitch, rolling	Determines proper pitch attitude & bank angle achieved	CR-1g / MM / 255 1 C: VC, M; 2 Me: MC; 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai, Ru/St Input Index: 50; I/O Input: 250; Output Index: V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
NN.	ESTABLISHES CLIMBING TURN Visual-Pitch att: constant Bank att: constant Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound, communication - WSO (calls bomb plot) Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, constant pitch roll stabilized	Determines need for trim	CR-1g / NN / 17 1 C: VA, CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: SP; Motor Output: Tr, St Input Index: 55; I/O Input: 110; Output Index: V-2 Adjusts trim, maintains stabilator pressure

HIGH DIVE TOSS - 45° DIVE BOMB DELIVERY/Controlled Range

SITUATION - Established on downwind, straight and level, 12,000 feet AGL, 325 kts., weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.



High dive toss maneuver diagram.

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2E **TASK** 45° High Dive Toss/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Dive Toss on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED ON DOWNWIND TO TARGET Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines proper spacing from lead & distance from target Sustains level flight	CR-2A A 287 1 C: VC; 2 Me: MC (I); 3 Mo: A Qty: 2-C; Dec Proc: CP; Motor Output: Ai St Input Index: 35; I/O Input: 70; Output Index: V-2 Maintains required aileron & stabilator control
B.	CONTINUES DOWNWIND Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: A/S, Alt. Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines base roll in position Sustains level flight	CR-2B B 287 1 C: VC; 2 Me: MC (I); 3 Mo: A Qty: 2-C; Dec Proc: CP; Motor Output: Ai St Input Index: 45; I/O Input: 90; Output Index: V-2 Maintains required aileron & stabilator control
C.	PREPARES TURN TO BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Anticipates roll in to base leg Sustains level flight	CR-2A C 327 1 C: VC; 2 Me: MR (I); 3 Mo: A Qty: 2-C; Dec Proc: CP; Motor Output: Ai St Input Index: 35; I/O Input: 70; Output Index: V-2 Maintains required aileron & stabilator control
D.	STARTS ROLL IN TO BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines position to roll in to base & maintain proper spacing	CR-2D D 270 1 C: VC; 2 Me: MC; 3 Mo: R Qty: 2-C; Dec Proc: CP; Motor Output: Ai Rv St Input Index: 35; I/O Input: 175; Output Index: V-5 Coordinates aileron & rudder movement with stabilator pressure

SITUATION: Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g TASK 45° High Dive Toss/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Dive Toss on prescribed target DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES ROLL IN Visual-Pitch att: increasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound, communication - (Lead cleared "in" by range officer) Control-Increased aileron, stabilator & rudder pressure Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate & need for power	CR-2g E 280 1 C: VA CM; 2 Me: MC; 3 Mo: R A-C; CP; Ai RU/St Th 65; 325; V-5 Maintains coordinated aileron & rudder pressure, increases stabilator pressure, adjusts throttle
F.	STOPS ROLL IN Visual-Pitch att: increasing Bank att: constant Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron & rudder, increased stabilator pressure, throttle advance Motion-Increasing positive G, pitching up, rolling	Determines proper bank attitude approaching	CR-2g F 260 1 C: VA CM; 2 Me: MC; 3 Mo: A A-C; CP; Ai RU/St 65; 325; V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
G.	ESTABLISHES TURN TO BASE Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Determines need to communicate (position & fuel) to range officer Sustains level flight	CR-2g G 292 1 C: VC M; 2 Me: MC (I); 3 Mo: A 3-C; CP; Ai Dc /St Cm 45; 90; V-2 Maintains required aileron & stabilator control, activates mic. button, communicates
H.	PREPARES ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication Control-Aileron & stabilator pressure, mic. switch function Motion-Constant positive G, pitch & roll constant	Anticipates roll out to base Sustains turn	CR-2g H 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A A-C; CP; Ai St 60; 120; V-2 Maintains required aileron & stabilator control

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g **TASK** 45° High Dive Toss/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Dive Toss on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	STARTS ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Determines position to roll out to base for spacing & distance from target	CR-2g TASK NO. I SKILL NO. 275 SLOT NO. 1 C: KIND VC M; QUANTITY 3-C; INPUT INDEX 50 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 250 3 Mo: CONTINUITY R; MOTOR OUTPUT A/R/St; OUTPUT INDEX V-5 Coordinates aileron & rudder with stabilator movement
J.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron, stabilator & rudder pressure Motion-Decreasing positive G, pitch decreasing, rolling	Determines satisfactory roll rate & need to reduce power	CR-2g TASK NO. J SKILL NO. 275 SLOT NO. 1 C: KIND VC M; QUANTITY 3-C; INPUT INDEX 55 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 275 3 Mo: CONTINUITY R; MOTOR OUTPUT A/R/St/Th; OUTPUT INDEX V-5 Maintains coordinated aileron & rudder pressure, relaxes stabilator pressure, adjusts throttle
K.	STOPS ROLL Visual-Pitch att: decreasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure, throttle reduction Motion-Decreasing positive G, pitch decreasing, rolling	Determines wings level approaching	CR-2g TASK NO. K SKILL NO. 17 SLOT NO. 1 C: KIND VA CM; QUANTITY 4-C; INPUT INDEX 65 2 Me: INFO PROCESS MC; DECISION PROC SP; I/O INPUT 130 3 Mo: CONTINUITY A; MOTOR OUTPUT A/R/St; OUTPUT INDEX V-2 Moves aileron & rudder, relaxes stabilator pressure
L.	ESTABLISHES LEVEL FLIGHT ON BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder, decreased stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines need to adjust altitude & airspeed for proper spacing	CR-2g TASK NO. L SKILL NO. 272 SLOT NO. 1 C: KIND VC M; QUANTITY 3-C; INPUT INDEX 40 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 80 3 Mo: CONTINUITY R; MOTOR OUTPUT St/Th; OUTPUT INDEX V-2 Decreases stabilator pressure and adjusts throttle

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g **TASK** 45° High Dive Toss/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Dive Toss on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	CONTINUES BASE LEG Visual-Pitch att: decreasing Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound Control-Increased stabilator pressure, throttle reduction Motion-Normal G, pitching down	Determines proper altitude, airspeed & spacing approaching	CR-2g M 256 1 C: VA CM / 2 Me: MC / 3 Mo: A QUANTITY: A-C / DECISION PROC: CP / MOTOR OUTPUT: St INPUT INDEX: 55 / I/O INPUT: 55 / OUTPUT INDEX: V-1 Increases stabilator pressure
N.	CONTINUES ON BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Increased stabilator pressure Motion-Normal G, pitch stabilized	Determines proper altitude, airspeed, & track; need for trim	CR-2g N 252 1 C: VC M / 2 Me: MC / 3 Mo: A QUANTITY: 3-C / DECISION PROC: CP / MOTOR OUTPUT: Tr / St INPUT INDEX: 45 / I/O INPUT: 90 / OUTPUT INDEX: V-2 Adjusts trim & relaxes stabilator pressure
O.	PREPARES TURN TO FINAL Visual-Pitch att: level Bank att: level Target Range landmarks Aural-Normal aircraft sound Control-Neutral stabilator pressure, trim switch function Motion-Normal G	Anticipates roll in and dive Sustains level flight	CR-2g O 327 1 C: VC / 2 Me: MR (I) / 3 Mo: A QUANTITY: 2-C / DECISION PROC: CP / MOTOR OUTPUT: Ai / St INPUT INDEX: 25 / I/O INPUT: 50 / OUTPUT INDEX: V-2 Maintains required aileron & stabilator pressure
P.	STARTS ROLL IN AND DIVE Visual-Pitch att: level Bank att: level Target Range landmarks Aural-Normal aircraft sound Control-Aileron & stabilator control Motion-Normal G	Determines position to roll in to final & need for power, need to communicate position to range officer	CR-2g P 270 1 C: VC / 2 Me: MC / 3 Mo: R QUANTITY: 2-C / DECISION PROC: CP / MOTOR OUTPUT: St Ai (Ru Fn Ds Cm) INPUT INDEX: 30 / I/O INPUT: 150 / OUTPUT INDEX: V-5 Activates mic. button & communicates, coordinates aileron & rudder movement, maintains stabilator pressure, moves throttle (to full mil.)

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g **TASK** 45° High Dive Toss/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Dive Toss on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Q.	CONTINUES ROLL IN Visual-Pitch att: increasing Bank att: rolling Target Range landmark Aural-Chg. in aircraft sound, communication Control-Increased aileron, stabilator & rudder pressure, throttle increase, mic. button function Motion-Positive G onset, pitching up, rolling	Determines satisfactory pitch & roll rate	CR-2g Q 279 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Se Ru 70; 280; V-4 Maintains coordinated aileron, stabilator & rudder pressure
R.	CONTINUES ROLL & BEGINS PULL DOWN Visual-Pitch att: increasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication - aircraft cleared in hot by range officer Control-Constant aileron, stabilator & rudder pressure Motion-Constant positive G, pitching up, rolling	Determines satisfactory pitch & roll attitude approaching	CR-2g R 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Ru/St 55; 275; V-5 Maintains coordinated aileron & rudder pressure with stabilator movement
S.	STOPS ROLL AND CONTINUES PULL Visual-Pitch att: decreasing Bank att: rolling Target Aural-Chg. in aircraft sound Control-Constant aileron & rudder, increased stabilator pressure Motion-Increasing positive G, pitching down, rolling	Determines proper roll attitude achieved & desired pitch movement	CR-2g S 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Ru/St 50; 250; V-5 Coordinates aileron & rudder movement, continues stabilator pressure
T.	ESTABLISHES DIVING TURN Visual-Pitch att: decreasing Bank att: stabilized Target Aural-Chg. in aircraft sound Control-Neutral aileron, stabilator & rudder pressure Motion-Increasing positive G, pitching down, roll stabilized	Sustains descending turn	CR-2g T 372 1 C: VA M; 2 Me: I; 3 Mo: A 3-C; CP; Ai St 35; 70; V-2 Maintains required aileron & stabilator control

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g **TASK** 45° High Dive Toss/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Dive Toss on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
U.	PREPARES ROLL OUT AND DIVE TO FINAL Visual-Pitch att: constant Bank att: constant Target/canopy Aural-Chg. in aircraft sound communication Control-Aileron, stabilator & rudder pressure Motion-Positive G, pitch & roll constant	Anticipates roll out to final dive Sustains descending turn	CR-2g U 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: Ai St Input Index: 55; I/O Input: 110; Output Index: V-2 Maintains required aileron & stabilator control
V.	STARTS ROLL OUT, MAINTAINS DIVE Visual-Pitch att: constant Bank att: roll Target/sight Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Positive G, pitch & roll constant	Determines proper position to roll out to final with satisfactory dive angle	CR-2g V 280 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: Ai Ru St Input Index: 45; I/O Input: 225; Output Index: V-5 Coordinates aileron & rudder, maintains stabilator pressure
W.	CONTINUES ROLL OUT, MAINTAINS DIVE Visual-Pitch att: constant Bank att: roll Target/sight Aural-Chg. in aircraft sound Control-Increased aileron & rudder, constant stabilator pressure Motion-Positive G, pitch constant, rolling	Determines satisfactory roll out rate	CR-2g W 280 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: Ai Ru St Th Input Index: 50; I/O Input: 250; Output Index: V-5 Maintains coordinated aileron & rudder pressure, constant stabilator pressure, moves throttle
X.	STOPS ROLL, MAINTAINS DIVE Visual-Pitch att: constant Bank att: roll Target/sight Aural-Chg. in aircraft sound Control-Constant aileron & rudder, constant stabilator pressure, throttle reduced Motion-Decreasing positive G, pitch constant, rolling	Determines wings level achieved & need to communicate - WSO (that radar is locked on)	CR-2g X 17 1 C: VA CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: SP; Motor Output: Ai St Ru Com Input Index: 55; I/O Input: 110; Output Index: V-2 Moves aileron & rudder, maintains stabilator pressure, communicates - WSO

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g TASK 45° High Dive Toss/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Dive Toss on prescribed target DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Y.	ESTABLISHES FINAL APPROACH TO TARGET Visual-Pitch att: descent (constant) Bank att: level Target/sight Flt.Inst: ADI, Alt & A/S Aural-Chg. in aircraft sound communication - WSO (calls "cleared to pickle") Control-Neutral aileron & rudder, constant stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines proper dive angle, need to decrease power, & adjust trim	CR-2g Y 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: Th, Tr, St Input Index: 65; I/O Input: 110; Output Index: V-2 Moves throttle, adjusts trim & maintains stabilator pressure
Z.	PREPARES FINAL APPROACH Visual-Pitch att: constant Bank att: level Target/sight Aural-Chg. in aircraft sound, communication - WSO *(calls A/S & Alt.) Control-Constant stabilator pressure, throttle decrease, trim switch Motion-Normal G	Anticipates delivery Sustains level dive	CR-2g Z 332 1 C: VA, C; 2 Me: MR (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai, St Input Index: 40; I/O Input: 80; Output Index: V-2 Maintains required aileron & stabilator pressure
AA.	STARTS FINAL APPROACH TO TARGET Visual-Pitch att: constant Bank att: level Target/pipper Flt.Inst: A/S, Alt. Aural-Chg. in aircraft sound *communication - WSO Control-Aileron & stabilator pressure Motion-Normal G	Sustains level dive	CR-2g AA 132 1 C: VA, C; 2 Me: I; 3 Mo: A Quantity: 3-C; Decision Proc: SP; Motor Output: Ai, St Input Index: 45; I/O Input: 90; Output Index: V-2 Maintains required aileron & stabilator pressure
BB.	CONTINUES FINAL APPROACH Visual-Pitch att: constant Bank att: level Target/pipper Aural-Chg. in aircraft sound *communication - WSO Control-Aileron & stabilator pressure Motion-Normal G	Determines analog bar/sight relationship & need to place pipper on the target & need for trim	CR-2g BB 252 1 C: VA, C; 2 Me: MC; 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai, Ty, Tr, St Input Index: 40; I/O Input: 80; Output Index: V-2 Adjusts trim; maintains required aileron, stabilator & rudder pressure

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g **TASK** 45° High Dive Toss/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Dive Toss on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
CC.	CONTINUES FINAL APPROACH Visual-Pitch att: constant Bank att: level Target/pipper Aural-Chg. in aircraft sound *communication - WSO Control-Aileron, stabilator & rudder pressure; trim switch function Motion-Normal G	Determines need to maintain pipper on target	CR-2g CC 12 1 C: VA C, 3-C, 50 2 Me: MC, SP, 100 3 Mo: A, Ai Lo St, V-2 Maintains aileron, rudder & stabilator pressure
DD.	HOLDS PIPPER ON TARGET Visual-Pitch att: constant Bank att: level Target/pipper Flt.Inst: A/S, Alt. Aural-Normal aircraft sound, *communication - WSO Control-Aileron, stabilator & rudder pressure Motion-Normal G	Determines satisfactory sight picture & airspeed	CR-2g DD 252 1 C: VA C, 3-C, 45 2 Me: MC, CP, 90 3 Mo: A, Ai Lo St, V-2 Maintains aileron, rudder & stabilator pressure
EE.	PREPARES ORDNANCE DELIVERY & Visual-Pitch att: constant Bank att: level Target/pipper Aural-Chg. in aircraft sound, communication - WSO (calls 8500' ready pickle) Control-Aileron, stabilator & rudder pressure Motion-Normal G	PULL UP Anticipates 2G pull & bomb release Sustains level dive	CR-2g EE 332 1 C: VA C, 3-C, 40 2 Me: MR (I), CP, 80 3 Mo: A, Ai Lo St, V-2 Maintains required aileron, rudder & stabilator control
FF.	STARTS ORDNANCE DELIVERY Visual-Pitch att: constant Bank att: level Target/pipper Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, stabilator & rudder pressure Motion-Normal G	Determines proper sight picture & slant range, need to activate pickle button & begin 2G pull	CR-2g FF 272 1 C: VA C, 3-C, 40 2 Me: MC, CP, 80 3 Mo: R, Ds St, V-2 Activates pickle button & moves stabilator

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g **TASK** 45° High Dive Toss/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Dive Toss on prescribed target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
GG.	CONTINUES ORDNANCE DELIVERY Visual-Pitch att: increasing Bank att: level Target/pipper Aural-Chg. in aircraft sound, weapons tone Control-Constant aileron & rudder pressure, increased stabilator pressure, bomb button function Motion-Positive G onset, pitching up	Determines proper G schedule (2G's) & ground track	CR-2g GG 277 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4C; Decision Proc: CP; Motor Output: Ds St Input Index: 55; I/O Index: 110; Output Index: V-2 Maintains pickle button & stabilator pressure
HH.	STOPS ORDNANCE DELIVERY AND CONTINUES PULL UP Visual-Pitch att: increasing Bank att: level Target/pipper Pull-up lite Aural-Chg. in aircraft sound, weapons tone stops Control-Aileron, stabilator & rudder pressure; bomb button function Motion-Constant G, pitching up	Determines weapon release & need to increase G's (pull up)	CR-2g HH 37 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4C; Decision Proc: SP; Motor Output: Ds St Input Index: 60; I/O Input: 120; Output Index: V-2 Deactivates bomb button & moves stabilator
II.	CONTINUES OFF TARGET PULL UP Visual-Pitch att: increasing Bank att: level Target Aural-Chg. in aircraft sound Control-Neutral aileron & rudder pressure, increased stabilator pressure, bomb button function Motion-Increasing positive G, pitching up	Determines proper rate of pitch movement & G schedule	CR-2g II 276 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4C; Decision Proc: CP; Motor Output: St Input Index: 40; I/O Input: 40; Output Index: V-1 Maintains stabilator pressure
JJ.	STOPS OFF TARGET PULL UP Visual-Pitch att: climb Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant stabilator pressure Motion-Constant G, pitching up	Determines proper pitch attitude achieved & need for power	CR-2g JJ 277 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4C; Decision Proc: CP; Motor Output: Th St Input Index: 40; I/O Input: 80; Output Index: V-2 Moves throttle & relaxes stabilator pressure

SITUATION: Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g TASK 45° High Dive Toss/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Dive Toss on prescribed target DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
KK.	PREPARES TRANSITION TO CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: level Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Decreased stabilator pressure, throttle advance Motion-Decreasing positive G, pitching up	Anticipates climbing turn Sustains level climb	CR-2g KK 332 1 C: VC M; 3-C; 40 2 Me: MR (I); CP; 80 3 Mo: A; Ai St; V-2 Maintains required aileron & stabilator control
LL.	STARTS ROLL IN TO CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: level Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, pitch stabilized	Determines desired pitch attitude & position to begin roll, need for trim	CR-2g LL 275 1 C: VC M; 3-C; 50 2 Me: MC; CP; 250 3 Mo: R; Ai Ru Te Rt; V-S Coordinates aileron & rudder movement, adjusts trim, & relaxes stabilator pressure
MM.	CONTINUES ROLL IN CLIMBING TURN Visual-Pitch att: constant Bank att: rolling Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder, decreased stabilator pressure, trim switch function Motion-Constant positive G, pitch constant, rolling	Determines proper pitch attitude & satisfactory roll rate/turn for proper spacing	CR-2g MM 275 1 C: VC M; 3-C; 55 2 Me: MC; CP; 275 3 Mo: R; Ai Ru St; V-S Maintains coordinated aileron & rudder pressure, maintains stabilator pressure

SITUATION Established on downwind, straight and level, 12,000 feet AGL, 325 knots, weapons select switches set & confirmed with WSO, second aircraft, first pass, new event.

TASK NO. CR-2g TASK 45° High Dive Toss/Controlled Range AIRCRAFT F-4E

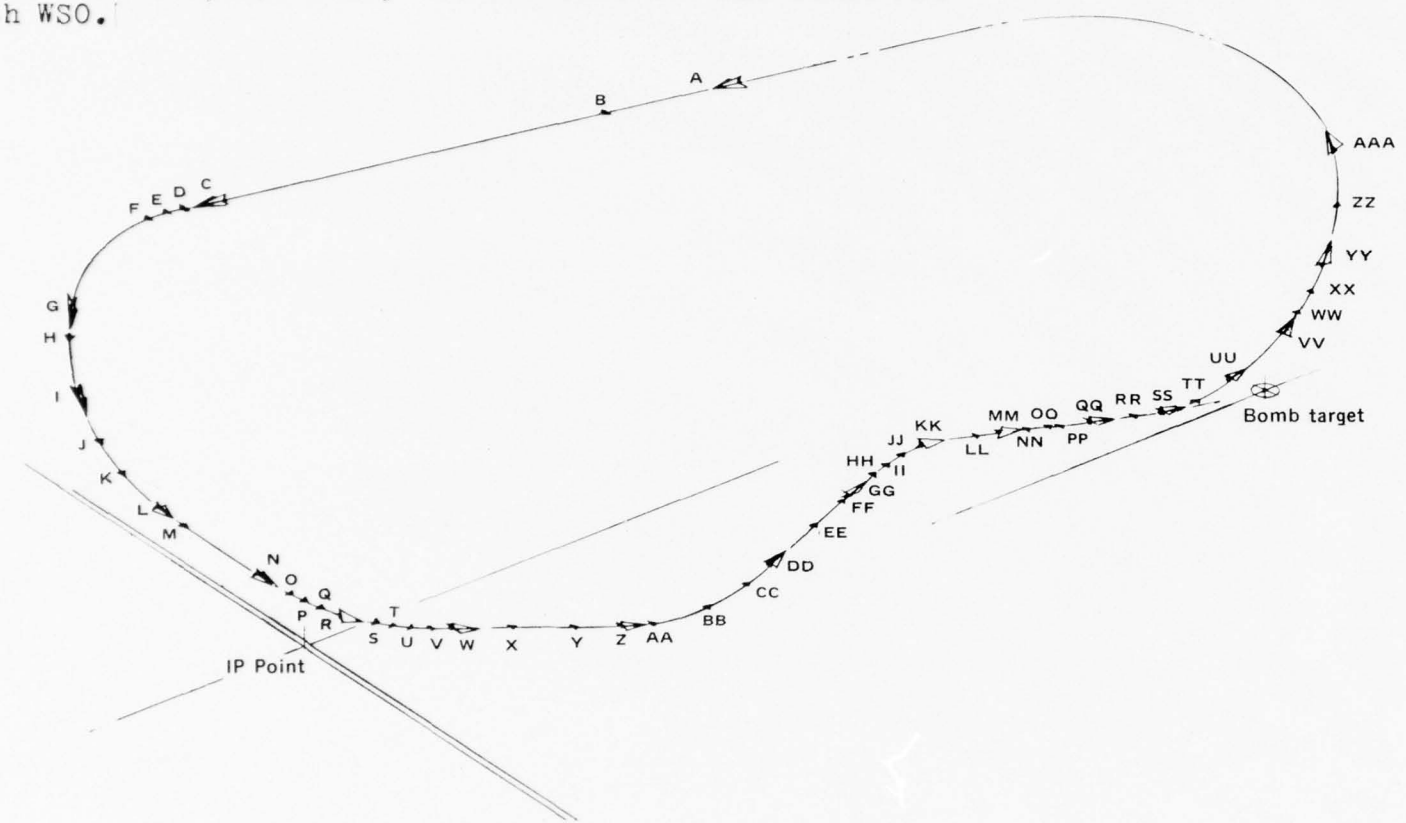
TASK GOAL Perform Dive Toss on prescribed target DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
NN.	STOPS ROLL IN CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: rolling Range landmarks Leading aircraft Flt.Inst: cross-check Aural-Normal aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Constant positive G, pitch constant, rolling	Determines desired pitch attitude & proper bank angle approaching	CR-2g NN 255 1 C: VC M / 2 Me: MC / 3 Mo: A QUANTITY: 3-C / DECISION PROC: CP / MOTOR OUTPUT: (AI RU) / St INPUT INDEX: 55 / I/O INPUT: 275 / OUTPUT INDEX: V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
00.	ESTABLISHES CLIMBING TURN Visual-Pitch att: constant Bank att: constant Range landmarks Leading aircraft Aural-Normal aircraft sound, communication - range officer (calls bomb plot) Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch constant, roll stabilized	Determines need for trim	CR-2g 00 17 1 C: VA CM / 2 Me: MC / 3 Mo: A QUANTITY: 4-C / DECISION PROC: SP / MOTOR OUTPUT: Tr / St INPUT INDEX: 45 / I/O INPUT: 90 / OUTPUT INDEX: V-2 Adjusts trim & relaxes stabilator pressure

ANGLE OFF POP-UP DELIVERY

(Low Angle Bomb, Controlled Range)

SITUATION - Established on downwind, straight and level, 2,000 feet AGL, 450 kts., all switches set and confirmed with WSO.



Pop-Up maneuver diagram.

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g **TASK** Pop-Up Low Angle Bomb Delivery/Range Controlled **AIRCRAFT** F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED ON DOWNWIND TO TARGET Visual-Pitch att: level Bank att: level Target IP Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron, rudder & stabilator pressure Motion-Normal G	Determines proper alt. & airspeed approaching Sustains level flight	CR3g / A / 47 1 C: KIND VC; QUANTITY 2-C; INPUT INDEX 45 2 Me: INFO PROCESS MC (I); DECISION PROC SP; I/O INPUT 40 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai St; OUTPUT INDEX V-2 Maintains required aileron & stabilator control
B.	CONTINUES DOWNWIND Visual-Pitch att: level Bank att: level IP Eng.Inst: check fuel Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines base roll in position & need to stabilize airspeed	CR3g / B / 247 1 C: KIND VC; QUANTITY 2-C; INPUT INDEX 30 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 60 3 Mo: CONTINUITY A; MOTOR OUTPUT Th St; OUTPUT INDEX V-2 Adjusts throttle, maintains stabilator pressure
C.	PREPARES DESCENDING BASE TURN Visual-Pitch att: level Bank att: level IP Aural-Chg. in aircraft sound Control-Constant stabilator pressure, throttle decrease Motion-Normal G	Anticipates roll in to base Sustains level flight	CR3g / C / 332 1 C: KIND VA C; QUANTITY 3-C; INPUT INDEX 30 2 Me: INFO PROCESS MR (I); DECISION PROC CP; I/O INPUT 60 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai St; OUTPUT INDEX V-2 Maintains required aileron & stabilator control
D.	STARTS ROLL IN TO DESCENDING BASE TURN Visual-Pitch att: level Bank att: level IP Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines position to roll into descending base turn & communicate position and fuel to range officer	CR3g / D / 270 1 C: KIND VC; QUANTITY 2-C; INPUT INDEX 25 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 125 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai RO / St VS CM; OUTPUT INDEX V-5 Activates mic. switch, communicates, coordinates aileron & rudder pressure, relaxes stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Range Controlled AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES ROLL IN Visual-Pitch att: decreasing Bank att: rolling IP Aural-Chg. in aircraft sound Control-Increased aileron & rudder pressure, reduced stabilator pressure, mic. switch function Motion-Positive G onset, pitching down, rolling	Determines satisfactory roll rate & need for power	CR-3g / E / 280 1 C: VA CM; 2 Me: MC; 3 Mo: R A-C; CP; Ai/Rd/St/Th 55; 275; V-5 Maintains coordinated aileron & rudder pressure, decreased stabilator pressure, adjusts power
F.	STOPS ROLL IN Visual-Pitch att: decreasing Bank att: rolling IP Aural-Chg. in aircraft sound Control-Constant aileron, reduced stabilator pressure, throttle advance Motion-Positive G, pitching down, rolling	Determines proper pitch & bank attitude achieved	CR-3g / F / 260 1 C: VA CM; 2 Me: MC; 3 Mo: A A-C; CP; Ai/Rd/St 60; 250; V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
G.	ESTABLISHES DESCENDING TURN Visual-Pitch att: constant (descent) Bank att: constant IP Aural-Normal aircraft sound Control-Neutral aileron & rudder, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Sustains descending turn	CR-3g / G / 132 1 C: VC M; 2 Me: I; 3 Mo: A 3-C; SP; Ai/St 35; 70; V-2 Maintains required aileron & stabilator pressure
H.	PREPARES FOR ROLL OUT OF DESCENDING TURN Visual-Pitch att: constant Bank att: constant IP Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Anticipates roll out to base Sustains descending turn	CR-3g / H / 332 1 C: VC M; 2 Me: MR (E); 3 Mo: A 3-C; CP; Ai/St 40; 80; V-2 Maintains required aileron & stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g **TASK** Pop-Up Low Angle Bomb Delivery/Range Controlled **AIRCRAFT** F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	STARTS ROLL OUT TO LEVEL BASE Visual-Pitch att: constant Bank att: constant IP Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Determines base roll out position in relation to IP	CR-3g TASK NO. I SKILL NO. 275 SLOT NO. 1 C: KIND VC M; QUANTITY 3-C; INPUT INDEX 40 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 200 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai (2) / St; OUTPUT INDEX V-5 Coordinates aileron & rudder pressure, moves stabilator
J.	CONTINUES ROLL OUT Visual-Pitch att: increasing Bank att: roll IP Aural-Normal aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Decreased positive G, pitching up, rolling	Determines satisfactory roll rate	CR-3g TASK NO. J SKILL NO. 275 SLOT NO. 1 C: KIND VC M; QUANTITY 3-C; INPUT INDEX 45 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 225 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai (2) / St; OUTPUT INDEX V-5 Maintains coordinated aileron & rudder with stabilator movement
K.	STOPS ROLL Visual-Pitch att: increasing Bank att: roll IP Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Decreased positive G, pitching up, rolling	Determines wings level & proper altitude approaching	CR-3g TASK NO. K SKILL NO. 257 SLOT NO. 1 C: KIND VA CM; QUANTITY A-C; INPUT INDEX 50 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 100 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai (2) St; OUTPUT INDEX V-2 Moves aileron & rudder, relaxes stabilator pressure
L.	ESTABLISHES ON BASE LEG TO IP, LEVEL @ 100 FEET AGL, 550 KNOTS Visual-Pitch att: level Bank att: level Range landmarks (Nav. to IP) Aural-Normal aircraft sound Control-Increased aileron & rudder pressure, decreased stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines proper altitude & airspeed and need for trim	CR-3g TASK NO. L SKILL NO. 257 SLOT NO. 1 C: KIND VC M; QUANTITY 3-C; INPUT INDEX 40 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 80 3 Mo: CONTINUITY A; MOTOR OUTPUT Tr St; OUTPUT INDEX V-2 Adjusts trim, relaxes stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Range Controlled AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept, 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	CONTINUES ON BASE LEG Visual-Pitch att: level Bank att: level Range landmarks Aural-Normal aircraft sound Control-Decreased stabilator pressure, trim switch function Motion-Normal G	Determines IP roll in position Sustains level flight	CR-3g M 287 1 C: VC; 2 Me: MC (I); 3 Mo: A 2-C; CP; Ai/St 25; 50; V-2 Maintains required aileron & stabilator pressure
N.	PREPARES FOR TURN AT IP Visual-Pitch att: level Bank att: level Range landmark (IP) Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Anticipates roll into IP final approach Sustains level flight	CR-3g N 327 1 C: VC; 2 Me: MR (I); 3 Mo: A 2-C; CP; Ai/St 25; 50; V-2 Maintains required aileron & stabilator control
O.	STARTS ROLL IN AT IP Visual-Pitch att: level Bank att: level Range landmark (IP) Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines position to roll into IP final approach heading	CR-3g O 269 1 C: VC; 2 Me: MC; 3 Mo: R 2-C; CP; Ai/St/Ru 25; 100; V-4 Coordinates aileron, rudder & stabilator movement
P.	CONTINUES ROLL IN Visual-Pitch att: increasing Bank att: rolling Range landmark (IP) Aural-Normal aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate & need for power	CR-3g P 275 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai/Ru/St/Th 45; 225; V-5 Maintains coordinated aileron & rudder pressure, increased stabilator pressure, adjusts throttle

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Q.	STOPS ROLL IN Visual-Pitch att: increasing Bank att: rolling Range landmark IP Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, increased stabilator pressure, throttle advance Motion-Increasing positive G, pitching, rolling	Determines proper bank attitude achieved	CR3g Q 20 1 C: VA CM; 4-C; 60 2 Me: NC; SP; 300 3 Mo: A; Ai R2/St; V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
R.	ESTABLISHES TURN Visual-Pitch att: constant Bank att: constant Range landmark IP Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Sustains level turn	CR3g R 370 1 C: VC M; 3-C; 40 2 Me: I; CP; 80 3 Mo: A; Ai St; V-2 Maintains required aileron & stabilator pressure
S.	PREPARES FOR ROLL OUT ON REFERENCE HEADING Visual-Pitch att: constant Bank att: constant Range landmark IP Flt.Inst: HSI Aural-Normal aircraft sound, communication - WSO (calls out heading) Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Anticipates roll out on reference heading Sustains level turn	CR3g S 337 1 C: VA M; 4-C; 50 2 Me: MR (I); CP; 100 3 Mo: A; Ai St; V-2 Maintains required aileron & stabilator pressure
T.	STARTS ROLL OUT Visual-Pitch att: constant Bank att: constant Range landmark IP Flt.Inst: HSI Aural-Normal aircraft sound, communication - WSO (calls "roll out") Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Discerns referenced roll out heading	CR3g T 200 1 C: VA CM; 4-C; 50 2 Me: SC; SP; 250 3 Mo: R; Ai R2/St; V-5 Coordinates aileron & rudder, relaxes stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g **TASK** Pop-Up Low Angle Bomb Delivery/Range Controlled **AIRCRAFT** F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
U.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: rolling Aural-Normal aircraft sound, communication-WSO (heading on roll out) Control-Increased aileron & rudder pressure, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines satisfactory roll rate	CR-3g / 4 / 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai, R, St 45; 225; V-5 Maintains coordinated aileron & rudder with relaxed stabilator pressure
V.	STOPS ROLL Visual-Pitch att: decreasing Bank att: roll Ground terrain Aural-Normal aircraft sound, communication - WSO *(calls time countdown) Control-Constant aileron & rudder pressure, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines reference heading & wings level flight approaching	CR-3g / V / 17 1 C: VA, CM; 2 Me: MC; 3 Mo: A 4-C; SP; Ai, R, St 50; 100; V-2 Moves aileron & rudder, relaxes stabilator pressure
W.	ESTABLISHES LEVEL FLIGHT ON REFERENCE HEADING Visual-Pitch att: level Bank att: level Ground terrain Aural-Normal aircraft sound, *communication - WSO Control-Neutral aileron & rudder pressure, decreased stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines need to adjust altitude & heading, need to increase airspeed	CR-3g / W / 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai, St, R, Th 35; 175; V-5 Coordinates aileron, rudder & stabilator; moves throttle (to AB range)
X.	CONTINUES ON REFERENCE HEADING Visual-Pitch att: decreasing Bank att: level Ground terrain Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure, throttle advance Motion-Normal G, acceleration	Determines proper altitude & reference heading, need for trim	CR-3g / X / 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A 4-C; CP; Ai, St, R, Th 50; 100; V-2 Maintains aileron, rudder & stabilator pressure, adjusts trim (increased control sensitivity in pitch)

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g **TASK** Pop-Up Low Angle Bomb Delivery/Range Controlled **AIRCRAFT** F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Y.	CONTINUES ON REFERENCE HEADING Visual-Pitch att: level Bank att: level Ground Terrain Flt.Inst: HSI Aural-Chg. in aircraft sound communication - WSO (calls "ready") Control-Aileron & stabilator pressure, trim switch function Motion-Normal G, buffeting	Sustains level flight & maintains reference heading Discerns communication	CR-3g / Y / 217 1 C: VA, CM; 2 Me: SC, (E); 3 Mo: A A-C / SP / A, St 50 / 100 / V-2 Maintains required aileron & stabilator control
Z.	PREPARES FOR POP-UP Visual-Pitch att: level Bank att: level Ground terrain Pop-up point Aural-Normal aircraft sound, communication - WSO Control-Aileron & stabilator pressure Motion-Normal G, buffeting	Anticipates "pull" call and pop-up Sustains level flight	CR-3g / Z / 337 1 C: VA, CM; 2 Me: MP(I); 3 Mo: A A-C / CP / A, St 40 / 80 / V-2 Maintains required aileron & stabilator control
AA.	STARTS POP-UP AT WSO'S "PULL" CALL Visual-Pitch att: level Bank att: level Ground terrain Pop-Up point Aural-Normal aircraft sound, communication - WSO (calls "pull") Control-Aileron & stabilator pressure Motion-Normal G, buffeting	Determines need to start pop-up pull & communicate (calls "up" to range officer)	CR-3g / AA / 271 1 C: VA, CM; 2 Me: MC; 3 Mo: R A-C / CP / Ds, St 40 / 80 / V-2 Activates mic. button, communicates, moves stabilator
BB.	CONTINUES POP-UP Visual-Pitch att: increasing Bank att: level Flt.Inst:G meter, ADI Aural-Chg. in aircraft sound, communication Control-Increased stabilator pressure, mic. switch function Motion-Positive G onset, pitching up	Determines satisfactory rate of nose movement (G schedule, 2-3 G's)	CR-3g / BB / 276 1 C: VA, CM; 2 Me: MC; 3 Mo: R A-C / CP / St 50 / 50 / V-1 Maintains required stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Range Controlled AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
CC.	STOPS PULL UP Visual-Pitch att: increasing Bank att: level Flt.Inst: ADI Aural-Chg. in aircraft sound Control-Constant stabilator pressure Motion-Increased positive G, pitching up	Determines proper pitch attitude achieved	CR-3g CC 16 1 C: VA, CM; 2 Me: MC; 3 Mo: A Quantity: A-C; Decision Proc: SP; Motor Output: St Input Index: 35; I.O. Input: 35; Output Index: V-1 Relaxes stabilator pressure
DD.	ESTABLISHES LEVEL CLIMB 20° Visual-Pitch att: constant (climb) Bank att: level Target Aural-Chg. in aircraft sound Control-Aileron & rudder pressure, decreased stabilator pressure Motion-Decreasing positive G, pitch stabilized	Sustains level climb Discerns target	CR-3g DD 217 1 C: VA, CM; 2 Me: SC (I); 3 Mo: A Quantity: A-C; Decision Proc: SP; Motor Output: A' St Input Index: 45; I.O. Input: 90; Output Index: V-2 Maintains required aileron & stabilator control
EE.	CONTINUES LEVEL CLIMB Visual-Pitch att: constant (climb) Bank att: level Target Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Normal G, pitch constant	Sustains level climb Discerns target	CR-3g EE 217 1 C: VA, CM; 2 Me: SC (I); 3 Mo: A Quantity: A-C; Decision Proc: SP; Motor Output: A' St Input Index: 35; I.O. Input: 70; Output Index: V-2 Maintains required aileron & stabilator control
FF.	PREPARES FOR ROLL AND PULL TO TARGET Visual-Pitch att: constant (climb) Bank att: level Target Aural-Chg. in aircraft sound communication - WSO (calls "ready" to roll) Control-Aileron & stabilator pressure Motion-Normal G, pitch constant	Anticipates roll & pull toward target Sustains level climb	CR-3g FF 337 1 C: VA, CM; 2 Me: MR (I); 3 Mo: A Quantity: A-C; Decision Proc: CP; Motor Output: A' Sc Input Index: 40; I.O. Input: 80; Output Index: V-2 Maintains required aileron & stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGI, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g **TASK** Pop -Up Low Angle Bomb Delivery/Range Controlled **AIRCRAFT** F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
GG.	STARTS ROLL TOWARD TARGET Visual-Pitch att: constant Bank att: level Target Aural-Chg. in aircraft sound communication - WSO (calls "roll") Control-Aileron, rudder & stabilator pressure Motion-Normal G, pitch constant	Determines need to roll toward the target and call ("in") to range officer	CR-3g GG 280 1 C: VA CM; 4-C; 45 2 Me: MC; CP; 225 3 Mo: R; A 12 / St Cm; V-5 Activates mic. switch, communicates, coordinates aileron & rudder, increased stabilator pressure
HH.	CONTINUES ROLL AND STARTS PULL TOWARD TARGET Visual-Pitch att: constant Bank att: rolling Target Aural-Chg. in aircraft sound, communication - range officer replys ("cleared") Control-Increased aileron, rudder & stabilator pressure, mic. switch function Motion-Positive G onset, pitch constant, rolling	Determines need to continue roll & begin pull toward target	CR-3g HH 280 1 C: VA CM; 4-C; 60 2 Me: MC; CP; 300 3 Mo: R; A 12 / St; V-5 Coordinates aileron & rudder, moves stabilator
II.	CONTINUES ROLL & PULL TOWARD TARGET Visual-Pitch att: decreasing Bank att: rolling Target Aural-Chg. in aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Increased positive G, pitching down, rolling	Determines satisfactory roll rate & pitch movement (to keep from being too high at the apex MAP [Minimum Approach Parameters])	CR-3g II 277 1 C: VA CM; 4-C; 50 2 Me: MC; CP; 100 3 Mo: R; A 12 / St; V-2 Maintains constant aileron, rudder & stabilator pressure
JJ.	STOPS ROLL AND CONTINUES PULL Visual-Pitch att: decreasing Bank att: rolling Target Range landmarks (MAP) Aural-Chg. in aircraft sound, communication - WSO (calls "Pull" - down to target) Control-Constant aileron, rudder & stabilator pressure Motion-Constant positive G, pitching down, rolling	Determines proper bank attitude achieved & proper pitch movement	CR-3g JJ 257 1 C: VA CM; 4-C; 60 2 Me: MC; CP; 120 3 Mo: A; A 12 / St; V-2 Moves aileron & rudder, maintains constant stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Range Controlled AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
KK.	ESTABLISHED AT APEX OF CLIMB Visual-Pitch att: constant (inverted) Bank att: constant Target Range landmarks Aural-Chg. in aircraft sound, communication - WSO (countdown to pickle) Control-Increased aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G	(INVERTED) ON MAP Determines satisfactory MAP & need to continue delivery	CR-3g KK 276 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: St INPUT INDEX: 50; I/O INPUT: 50; OUTPUT INDEX: V-1 Increases stabilator pressure
LL.	STARTS ROLL OUT AND DIVE Visual-Pitch att: decreasing Bank att: constant Target/canopy Aural-Chg. in aircraft sound, communication - WSO Control-Increased stabilator pressure Motion-Constant positive G	Determines need to roll out to final with satisfactory dive angle	CR-3g LL 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4C; DECISION PROC: CP; MOTOR OUTPUT: (A, R) St INPUT INDEX: 35; I/O INPUT: 175; OUTPUT INDEX: V-5 Coordinates aileron & rudder movement, relaxes stabilator pressure
MM.	CONTINUES ROLL OUT AND DIVE Visual-Pitch att: decreasing Bank att: rolling Target/canopy Aural-Chg. in aircraft sound, communication - WSO Control-Increased aileron & rudder pressure, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines satisfactory roll rate & dive angle	CR-3g MM 277 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: A, R, St INPUT INDEX: 55; I/O INPUT: 110; OUTPUT INDEX: V-2 Maintains required aileron & rudder pressure, maintains stabilator pressure
NN.	STOPS ROLL AND MAINTAINS DIVE Visual-Pitch att: decreasing Bank att: rolling Target/canopy Aural-Chg. in aircraft sound, communication - WSO Control-Constant aileron & rudder pressure, stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines wings level & dive angle approaching	CR-3g NN 17 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: SP; MOTOR OUTPUT: A, R, St INPUT INDEX: 55; I/O INPUT: 110; OUTPUT INDEX: V-2 Moves aileron & rudder, maintains stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g **TASK** Pop-Up Low Angle Bomb Delivery/Range Controlled **AIRCRAFT** F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
OO.	ESTABLISHES FINAL APPROACH Visual-Pitch att: descent (constant) Bank att: level Target/canopy Sight Flt.Inst: cross-check Aural-Chg. in aircraft sound, communication - WSO [*] (calls air speed & dive angle) Control-Neutral aileron & rudder, constant stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines proper dive angle & need to reduce power, adjusts trim	CR3g OO 257 1 C: VA C'M; 2 Me: MC; 3 Mo: A A-C; CP; M Tr SC 50; 100; V-2 Moves throttle, adjusts trim & maintains stabilator pressure
PP.	PREPARES FINAL APPROACH AND PULL UP Visual-Pitch att: descent (constant) Bank att: level Target/sight Aural-Chg. in aircraft sound, communication - WSO [*] Control-Constant stabilator pressure, throttle reduced, trim switch function Motion-Normal G	Anticipates delivery & pull up Sustains level dive	CR3g PP 332 1 C: VA C'; 2 Me: MR (E); 3 Mo: A 3-C; CP; Ai SC 40; 80; V-2 Maintains required aileron & stabilator control
QQ.	STARTS FINAL APPROACH TO TARGET Visual-Pitch att: constant Bank att: level Target/pipper Aural-Chg. in aircraft sound, communication - WSO [*] Control-Aileron & stabilator pressure Motion-Normal G	Determines need to refine sight/target relationship	CR3g QQ 252 1 C: VA C'; 2 Me: MC; 3 Mo: A 3-C; CP; Ai SC RU 35; 70; V-2 Maintains aileron, rudder & stabilator pressure
RR.	CONTINUES FINAL APPROACH Visual-Pitch att: constant Bank att: level Target/pipper Aural-Normal aircraft sound, communication - WSO [*] Control-Increased aileron, rudder & stabilator pressure Motion-Normal G	Determines proper airspeed, dive angle & sight picture approaching	CR3g RR 252 1 C: VA C'; 2 Me: MC; 3 Mo: A 3-C; CP; M SC Ai RU 35; 70; V-2 Moves throttle; adjusts aileron, rudder & stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Range Controlled AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
SS.	RELEASES ORDNANCE Visual-Pitch att: constant Bank att: level Target/pipper Aural-Chg. in aircraft sound, communication - WSO (calls "pickle") Control-Aileron, rudder & stabilator pressure, throttle reduction Motion-Normal G	Determines proper sight picture & need to activate bomb release button Sustains dive	CR-3g SS 282 1 C: VA C; 2 Me: MC (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: St Th Input Index: 45; I/O Input: 90; Output Index: V-2 Activates pickle button maintains required aileron, rudder & stabilator control
TT.	STARTS OFF TARGET PULL UP Visual-Pitch att: constant Bank att: level Target Aural-Normal aircraft sound, communication - WSO (calls "pull") Control-Aileron, rudder & stabilator pressure, pickle button function Motion-Normal G	Determines need to initiate smooth 4G pull	CR-3g TT 271 1 C: VA C; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: St Input Index: 40; I/O Input: 40; Output Index: V-1 Moves stabilator
UU.	CONTINUES PULL UP Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Increased stabilator pressure Motion-Positive G onset, pitching up	Determines satisfactory pitch movement rate & need for power	CR-3g UU 277 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: St Th Input Index: 40; I/O Input: 80; Output Index: V-2 Maintains stabilator pressure & moves throttle
VV.	STOPS PULL UP TO CLIMBING TURN Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant stabilator pressure, throttle advance Motion-Increased positive G, pitching up	Determines proper pitch attitude achieved	CR-3g VV 256 1 C: VA CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: St Input Index: 45; I/O Input: 45; Output Index: V-1 Relaxes stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
WW.	PREPARES TO TRANSITION TO CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: level Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Decreased stabilator pressure Motion-Decreasing positive G, pitching up	Anticipates climbing turn Sustains level climb	CR3g WW 332 1 C: VC, M; 2 Me: MR (I); 3 Mo: A 3-C; CP; Ai, St 35; 70; V-2 Maintains required aileron & stabilator control
XX.	STARTS ROLL IN TO CLIMBING TURN Visual-Pitch att: constant Bank att: level Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, pitch stabilized	Determines desired pitch attitude & position to begin turn	CR3g XX 275 1 C: VC, M; 2 Me: MC; 3 Mo: R 3-C; CP; {Ai, Ru/St} 50; 250; V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
YY.	CONTINUES ROLL TO CLIMBING TURN Visual-Pitch att: constant Bank att: rolling Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch constant, rolling	Determines desired pitch attitude & satisfactory roll rate/turn for proper spacing	CR3g YY 275 1 C: VC, M; 2 Me: MC; 3 Mo: R 3-C; CP; {Ai, Ru/St} 50; 250; V-5 Maintains coordinated aileron & rudder pressure, increased stabilator pressure
ZZ.	STOPS ROLL IN CLIMBING TURN Visual-Pitch att: constant Bank att: rolling Range landmarks Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Pitch constant, rolling	Determines proper pitch attitude & bank angle achieved	CR3g ZZ 15 1 C: VC, M; 2 Me: MC; 3 Mo: A 3-C; SP; {Ai, Ru/St} 50; 250; V-5 Coordinates aileron & rudder movement, maintains stabilator pressure

SITUATION Established on downwind, straight and level, 2,000 feet AGL, 450 knots, all switches set and confirmed with WSO.

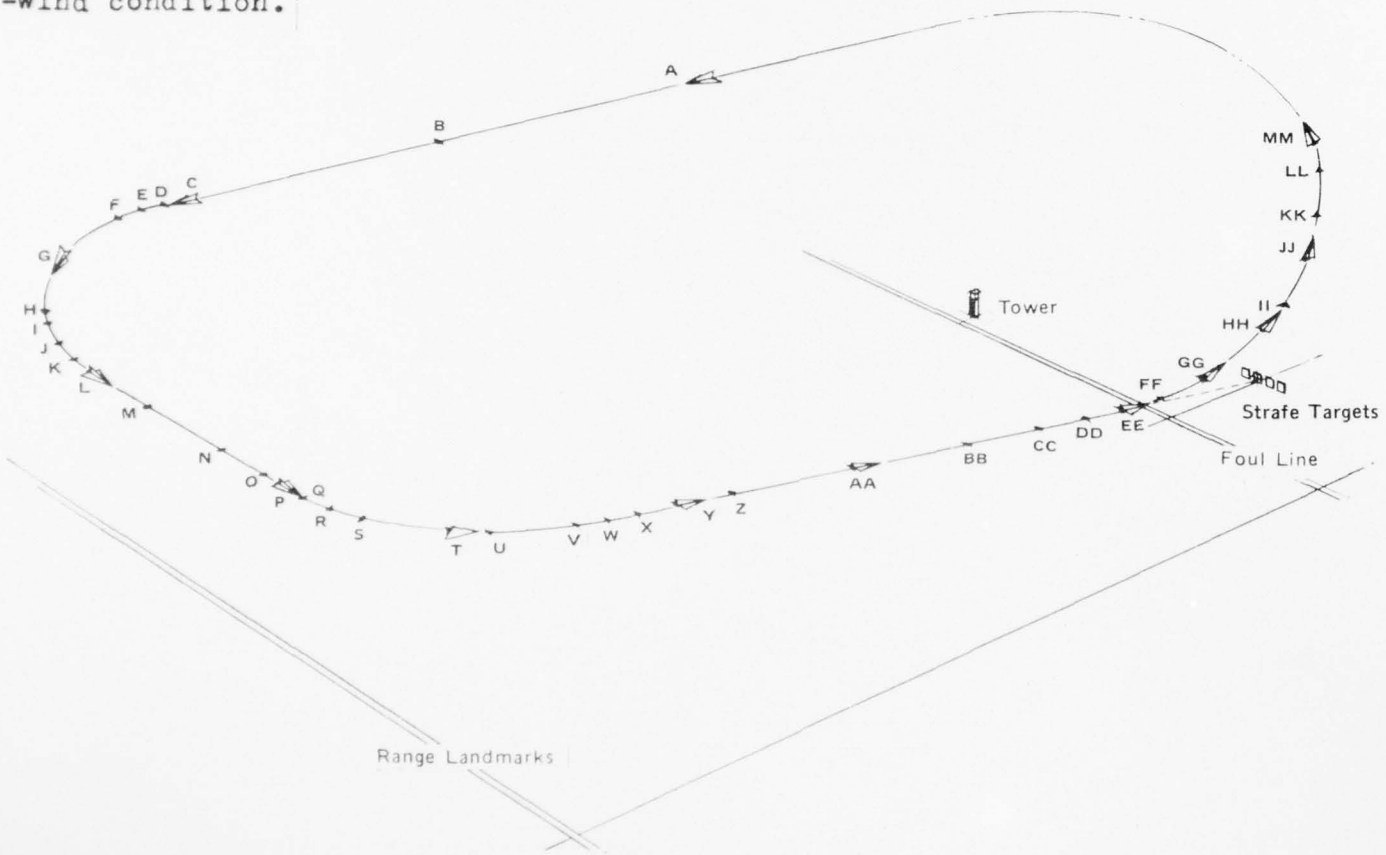
TASK NO. CR-3g TASK Pop-Up Low Angle Bomb Delivery/Range Controlled AIRCRAFT F-4E

TASK GOAL Perform Pop-Up Ordnance Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
AAA.	ESTABLISHES CLIMBING TURN Visual-Pitch att: constant Bank att: constant Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch constant, roll stabilized	Determines need for trim	CR3g AAA 12 1 C: VC M; 3-C; 40 2 Me: MO; SP; 80 3 Mo: A; Tr St; V-2 Adjusts trim & relaxes stabilator pressure

LOW ANGLE STRAFE DELIVERY/Controlled Range

SITUATION - Established on downwind, straight and level, 3,500 feet AGL, 350 kts., weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.



Low angle strafe maneuver diagram.

AD-A061 387 DESIGN PLUS ST LOUIS MO F/G 5/9
DEVELOPMENT AND APPLICATION OF A TASK TAXONOMY FOR TACTICAL FLY--ETC(U)
SEP 78 R P MEYER, J I LEVESON, G L PAPE F33615-77-C-0020
UNCLASSIFIED AFHRL-TR-78-42(I) NL

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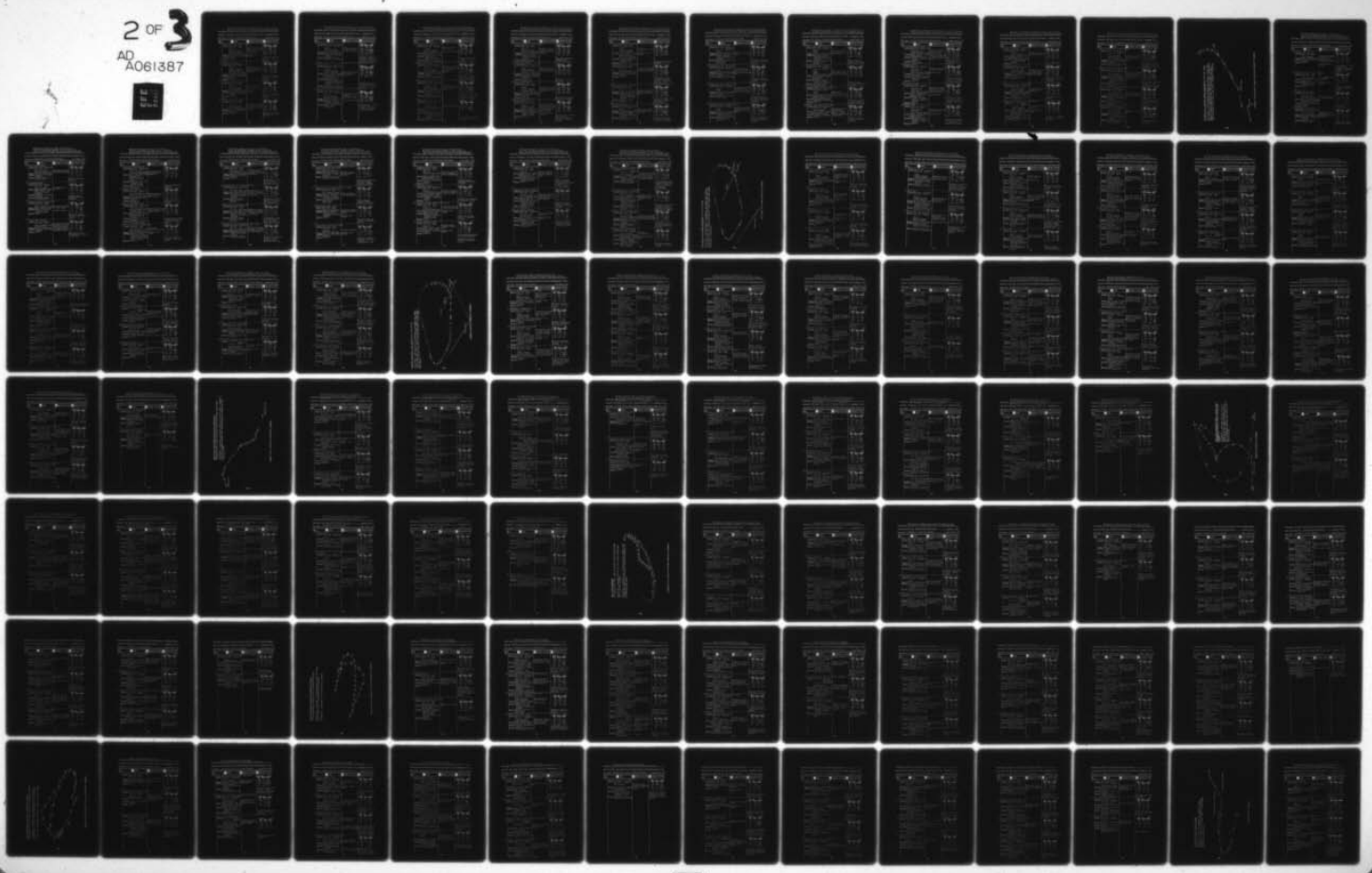


SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED ON DOWNWIND TO TARGET Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines proper spacing with proper A/S & Alt. approaching Sustains level flight	CR-4g A 287 1 C: VC; 2 Me: MC (I); 3 Mo: A 2-C; CP; Ai SC 45; 90; V-2 Maintains required aileron & stabilator control
B.	CONTINUES DOWNWIND Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Eng.Inst: check fuel Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines base roll in position & need to stabilize airspeed	CR-4g B 247 1 C: VC; 2 Me: MC; 3 Mo: A 2-C; CP; Th SC 50; 100; V-2 Adjusts throttle, maintains stabilator pressure
C.	PREPARES FOR TURN TO BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Constant stabilator pressure, throttle decrease Motion-Normal G	Anticipates roll in to base leg Sustains level flight	CR-4g C 327 1 C: VC; 2 Me: MR (I); 3 Mo: A 2-C; CP; Ai SC 35; 70; V-2 Maintains required aileron & stabilator control
D.	STARTS ROLL IN TO BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines position to roll in to base & maintain proper spacing	CR-4g D 269 1 C: VC; 2 Me: MC; 3 Mo: R 2-C; CP; Ai Ru SC 35; 140; V-4 Coordinates aileron, rudder & stabilator pressure

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES ROLL IN Visual-Pitch att: increasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate & need for power	CR-4g E 275 1 C: V CM; 2 Mo: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: Ai Rv St Th Input Index: 55; I/O Index: 275; Output Index: V-S Maintains coordinated aileron & rudder pressure, increased stabilator pressure, adjusts throttle
F.	STOPS ROLL IN Visual-Pitch att: increasing Bank att: roll Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound, communication - (lead aircraft cleared by range officer) Control-Constant aileron & rudder pressure, increased stabilator pressure, throttle advance Motion-Increasing positive G, pitching up, rolling	Determines proper bank attitude achieved	CR-4g F 260 1 C: V A CM; 2 Mo: MC; 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: Ai Rv St Input Index: 70; I/O Index: 350; Output Index: V-S Coordinates aileron & rudder pressure, maintains stabilator pressure
G.	ESTABLISHES TURN TO BASE Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Determines need to communicate (position & fuel) to range officer Sustains level turn	CR-4g G 242 1 C: V CM; 2 Mo: MC (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai Ds Rv Cm Input Index: 45; I/O Index: 90; Output Index: V-2 Activates mic. button, communicates, maintains required aileron, stabilator & rudder control

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
H.	PREPARES FOR ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication Control-Aileron & stabilator pressure, mic. button function Motion-Constant positive G, pitch & roll constant	Anticipates roll out to base Sustains level turn	CR-4g H 337 1 C: VA, CM; 2 Me: MR (I); 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, St INPUT INDEX: 60; I/O INDEX: 120; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
I.	STARTS ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Determines position to roll out to base for spacing and distance from target	CR-4g I 275 1 C: VC, M; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: (Ai, Ru), St INPUT INDEX: 50; I/O INDEX: 250; OUTPUT INDEX: V-5 Coordinates aileron & rudder, relaxes stabilator pressure
J.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: roll Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines satisfactory roll rate & need to reduce power	CR-4g J 275 1 C: V, CM; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: (Ai, Ru), St, Th INPUT INDEX: 55; I/O INDEX: 275; OUTPUT INDEX: V-5 Maintains coordinated aileron & rudder with stabilator movement, adjusts throttle
K.	STOPS ROLL Visual-Pitch att: decreasing Bank att: roll Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound, Control-Constant aileron & rudder pressure with decreased stabilator pressure, throttle reduction Motion-Decreasing positive G, pitching down, rolling	Determines wings level approaching	CR-4g K 17 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: 4C; DECISION PROC: SP; MOTOR OUTPUT: Ai, Ru, St INPUT INDEX: 65; I/O INDEX: 130; OUTPUT INDEX: V-2 Moves aileron & rudder, relaxes stabilator pressure

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
L.	ESTABLISHES LEVEL FLIGHT ON BASE Visual-Pitch att: level Bank att: level Target Range landmarks Flt.Inst: cross-check Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, decreased stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines level flight & need to adjust altitude & airspeed	CR-4g L 32 1 C: VC M; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: SP; MOTOR OUTPUT: St Th INPUT INDEX: 40; I/O INDEX: 80; OUTPUT INDEX: V-2 Decreases stabilator pressure and adjusts throttle
M.	CONTINUES BASE LEG Visual-Pitch att: decreasing Bank att: level Target Range landmarks Leading aircraft Flt.Inst: A/S, Alt. Aural-Chg. in aircraft sound Control-Increased stabilator pressure, throttle reduction Motion-Normal G, pitching down	Determines proper alt., airspeed & spacing approaching	CR-4g M 256 1 C: VA CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: St INPUT INDEX: 55; I/O INDEX: 55; OUTPUT INDEX: V-1 Decreases stabilator pressure
N.	CONTINUES ON BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: A/S, Alt. Aural-Normal aircraft sound Control-Decreased stabilator pressure Motion-Normal G, pitch stabilized	Determines proper airspeed, altitude & track; need for trim	CR-4g N 254 1 C: V CM; 2 Me: MC; 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: St Tr INPUT INDEX: 45; I/O INDEX: 90; OUTPUT INDEX: V-2 Adjusts trim, relaxes stabilator pressure
O.	CONTINUES ON BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron, rudder & stabilator pressure, trim switch function Motion-Normal G	Determines final roll in position approaching & need to communicate (position-in) to range officer Sustains level flight	CR-4g O 287 1 C: VC; 2 Me: MC (I); 3 Mo: A QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: Ai Ds St Cm INPUT INDEX: 30; I/O INDEX: 60; OUTPUT INDEX: V-2 Activates mic. button, communicates, maintains required aileron & stabilator control

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
P.	PREPARES FOR TURN TO FINAL Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication - aircraft cleared in hot by range officer Control-Aileron & stabilator pressure, mic. button function Motion-Normal G	Anticipates roll in & dive Sustains level flight	CR-4g TASK NO. P SKILL NO. 332 SLOT NO. 1 C: MIND VA C; QUANTITY 3-C; INPUT INDEX 45 2 Me: INFO PROCESS MR (I); DECISION PROC CP; I/O INDEX 90 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai St; OUTPUT INDEX V-2 Decreases stabilator pressure
Q.	STARTS ROLL IN TO FINAL TURN Visual-Pitch att: level Bank att: level Target Range landmarks Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines position to roll in to final & need for power	CR-4g TASK NO. Q SKILL NO. 270 SLOT NO. 1 C: MIND VC; QUANTITY 2-C; INPUT INDEX 30 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INDEX 150 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai/R St Th; OUTPUT INDEX V-5 Coordinates aileron & rudder movement, maintains stabilator pressure, moves throttle (to full mil.)
R.	CONTINUES ROLL IN AND DIVE Visual-Pitch att: level Bank att: roll Target Aural-Chg. in aircraft sound Control-Increased aileron & rudder pressure, constant stabilator pressure, throttle advance Motion-Positive G onset, rolling	Determines satisfactory roll rate & need to establish dive	CR-4g TASK NO. R SKILL NO. 280 SLOT NO. 1 C: MIND VA CM; QUANTITY 4-C; INPUT INDEX 50 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INDEX 250 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai R St; OUTPUT INDEX V-5 Maintains coordinated aileron & rudder pressure, moves stabilator
S.	STOPS ROLL IN DIVE Visual-Pitch att: decreasing Bank att: roll Target Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Positive G, pitching down, rolling	Determines proper roll & dive angle achieved	CR-4g TASK NO. S SKILL NO. 260 SLOT NO. 1 C: MIND VA CM; QUANTITY 4-C; INPUT INDEX 60 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INDEX 250 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai R St; OUTPUT INDEX V-5 Coordinates aileron & rudder, maintains stabilator pressure

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind confition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
T.	ESTABLISHES DIVING TURN Visual-Pitch att: descent (constant) Bank att: constant Target Aural-Chg. in aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Sustains descending turn	CR-4g T 151 1 C: VA CM; 2 Me: I; 3 Mo: A 4-C; SP; Ai St 40; 80; V-2 Maintains required aileron & stabilator pressure
U.	PREPARES FOR ROLL OUT TO FINAL Visual-Pitch att: constant Bank att: constant Target Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch & roll	Anticipates roll out & final dive Sustains descending turn	CR-4g U 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A 4-C; CP; Ai St 45; 90; V-2 Maintains required aileron & stabilator control
V.	STARTS ROLL OUT, MAINTAINS DIVE Visual-Pitch att: constant Bank att: constant Target Sight Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Positive G, constant pitch & roll	Determines position to roll out to final with satisfactory dive angle	CR-4g V 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Rd St 50; 250; V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
W.	CONTINUES ROLL OUT, MAINTAINS DIVE Visual-Pitch att: constant Bank att: rolling Target Sight Aural-Chg. in aircraft sound Control-Increased aileron & rudder, constant stabilator pressure Motion-Decreasing positive G, pitch constant, rolling	Determines proper roll out rate with satisfactory dive angle	CR-4g W 280 1 C: VA CM; 2 Me: MC; 3 Mo: R AC; CP; Ai Rd St 55; 275; V-5 Maintains coordinated aileron & rudder, relaxes stabilator pressure

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g TASK Low Angle Strafe/Controlled Range AIRCRAFT F-4E

TASK GOAL To fire on prescribed ground target DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
X.	STOPS ROLL, MAINTAINS DIVE Visual-Pitch att: decreasing Bank att: rolling Target Sight Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines wings level & dive angle approaching	CR-4g X 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: Ai, St, R Input Index: 55; I/O Index: 110; Output Index: V-2 Moves aileron & rudder, maintains stabilator pressure
Y.	ESTABLISHES FINAL APPROACH Visual-Pitch att: descent (constant) Bank att: level Target Sight Flt.Inst: ADI,A/S,Alt Aural-Chg. in aircraft sound communication - lead off target Control-Neutral aileron & rudder, constant stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines proper dive angle & alt., need to adjust trim	CR-4g Y 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: St, Tr Input Index: 60; I/O Index: 120; Output Index: V-2 Adjusts trim & maintains stabilator pressure
Z.	PREPARES FINAL APPROACH AND PULL UP Visual-Pitch att: constant Bank att: level Target Sight Aural-Chg. in aircraft sound communication - WSO *(calls airspeed & alt) Control-Constant stabilator, trim switch function Motion-Normal G	Anticipates delivery & pull up Sustains level dive	CR-4g Z 337 1 C: VA, C; 2 Me: MR (I); 3 Mo: A Quantity: A-C; Decision Proc: CP; Motor Output: Ai, R, St Input Index: 40; I/O Index: 80; Output Index: V-2 Maintains required aileron, rudder & stabilator pressure
AA.	STARTS FINAL APPROACH TO TARGET Visual-Pitch att: constant Bank att: level Target/pipper Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Determines refine sight/target picture (brings pipper up to aim point & adjusts for cross-wind)	CR-4g AA 272 1 C: VA, C; 2 Me: MO; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: Ai, R, St Input Index: 45; I/O Index: 90; Output Index: V-2 Adjusts aileron, rudder & stabilator pressure

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
BB.	CONTINUES FINAL APPROACH Visual-Pitch att: decreasing Bank att: level Target/pipper Range landmark (tower) Aural-Normal aircraft sound, *communication Control-Increased aileron, rudder & stabilator pressure Motion-Normal G, pitching down	Determines satisfactory airspeed & sight picture, firing position approaching, & need to reduce power (to stabilize sight in F-4E)	CR-4g ~~AB~~ 257 1 C: VA, CM; 2 Mo: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Th, St INPUT INDEX: 45; I/O INDEX: 90; OUTPUT INDEX: V-2 Moves throttle & adjusts stabilator pressure
CC.	STARTS FIRING Visual-Pitch att: constant Bank att: level Target/pipper Foul line Range landmark (tower) Aural-Chg. in aircraft sound *communication Control-Increased stabilator pressure, throttle reduction Motion-Normal G	Determines position to begin firing Sustains dive	CR-4g CC 292 1 C: VA, C; 2 Mo: MC (I); 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, 20 DS, St INPUT INDEX: 50; I/O INDEX: 100; OUTPUT INDEX: V-2 Activates trigger; maintains required aileron, stabilator & rudder control
DD.	CONTINUES FIRING Visual-Pitch att: constant Bank att: level Target/pipper Foul line Range landmark (tower) Aural-Normal aircraft sound, weapons discharge, *communication Control-Minimum aileron, rudder & stabilator pressure, trigger function Motion-Normal G	Determines continued proper sight/target picture for continued firing Sustains dive	CR-4g ~~AA~~ 292 1 C: VA, C; 2 Mo: MC (I); 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, 20 DS, St INPUT INDEX: 60; I/O INDEX: 120; OUTPUT INDEX: V-2 Maintains trigger activation; maintains required aileron, rudder & stabilator control
EE.	STOPS FIRING Visual-Pitch att: constant Bank att: level Target/pipper Foul line Range landmark (tower) Aural-Normal aircraft sound, weapons discharge, *communication Control-Minimum aileron, rudder & stabilator pressure, trigger function Motion-Normal G	Determines position to stop firing Sustains dive	CR-4g EE 292 1 C: VA, C; 2 Mo: MC (I); 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, 20 DS, St INPUT INDEX: 60; I/O INDEX: 120; OUTPUT INDEX: V-2 Maintains required aileron, stabilator & rudder control; deactivates trigger

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
FF.	STARTS OFF TARGET PULL UP Visual-Pitch att: constant Bank att: level Target Range landmarks Aural-Normal aircraft sound, *communication Control-Aileron, stabilator & rudder pressure; trigger function Motion-Normal G	Determines need to initiate pull up	CR-4g FF 31 1 C: VA C / 3-C / 45 2 Me: MC / SP / 45 3 Mo: R / St / V-1 Moves stabilator
GG.	CONTINUES PULL UP Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Increased stabilator pressure Motion-Positive G onset, pitching up	Determines satisfactory pitch movement rate & need for power	CR-4g GG 277 1 C: VA CM / 4-C / 40 2 Me: MC / CP / 80 3 Mo: R / St / Th / V-2 Maintains stabilator pressure & moves throttle
HH.	STOPS PULL UP TO CLIMBING TURN Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant stabilator pressure, throttle advance Motion-Increased positive G, pitching up	Determines proper pitch attitude achieved	CR-4g HH 276 1 C: VA CM / 4-C / 45 2 Me: MC / CP / 45 3 Mo: R / St / V-1 Relaxes stabilator pressure
II.	PREPARES TO TRANSITION TO CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: level Range landmarks Leading aircraft Aural-Normal aircraft sound, communication - range officers transmit strafe score Control-Decreased stabilator pressure Motion-Decreasing positive G, pitching up	Anticipates climbing turn Sustains level climb	CR-4g II 337 1 C: VA CM / 4-C / 40 2 Me: MR I / CP / 80 3 Mo: A / Ai St / V-2 Maintains required aileron & stabilator control

SITUATION Established on downwind, straight and level, 3,500 feet AGL, 350 knots, weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.

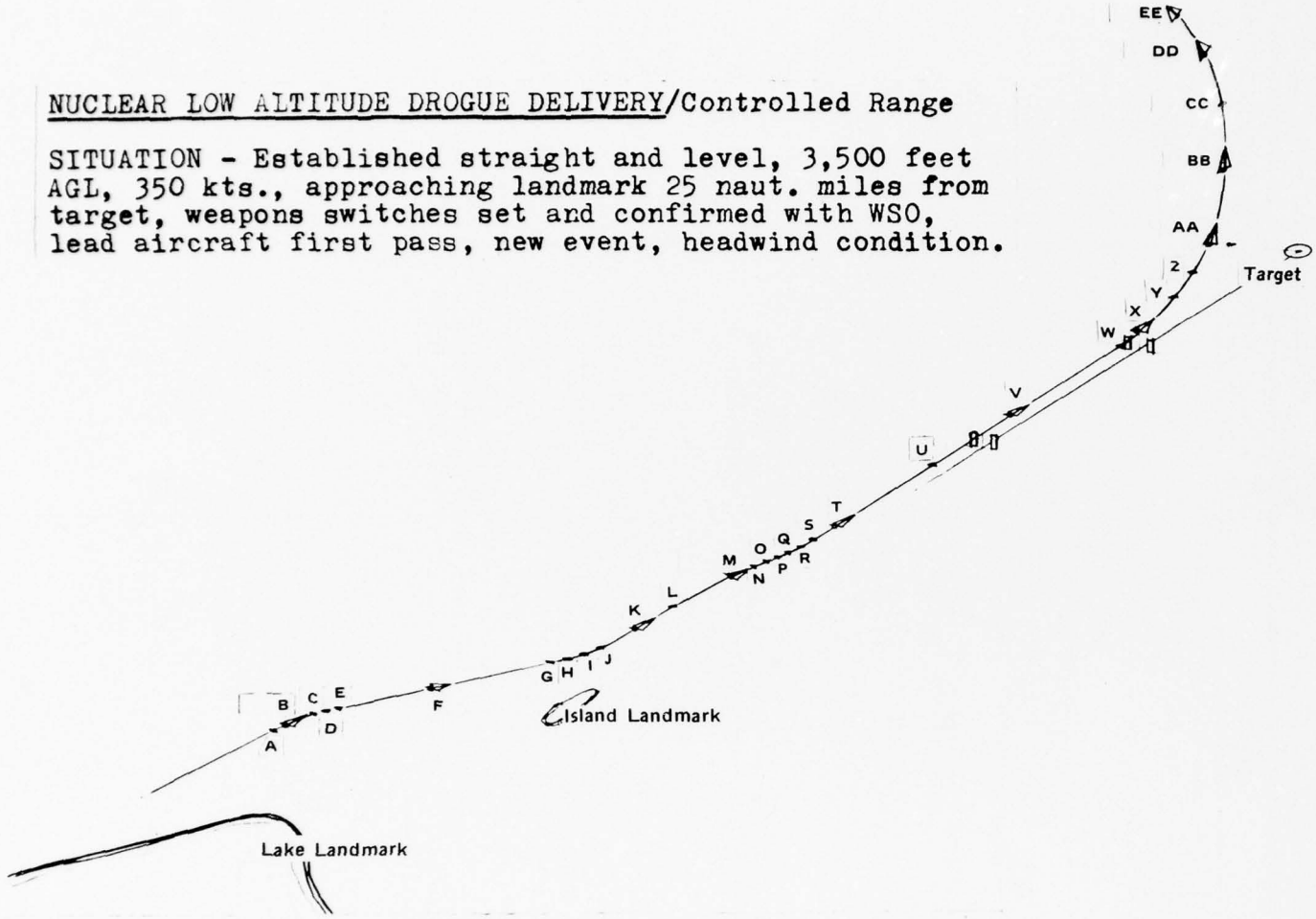
TASK NO. CR-4g **TASK** Low Angle Strafe/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To fire on prescribed ground target **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
JJ.	STARTS ROLL IN TO CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: level Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Decreasing positive G, pitch stabilized	Determines desired pitch attitude & position to begin roll	CR-4g JJ 275 1 C: V, CM; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: (Ai, Rd)/St Input Index: 50; I/O Index: 250; Output Index: V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
KK.	CONTINUES ROLL TO CLIMBING TURN Visual-Pitch att: constant Bank att: rolling Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch constant, rolling	Determines desired pitch attitude & satisfactory roll rate/turn for proper spacing	CR-4g KK 275 1 C: VC, M; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: (Ai, Rd)/St Input Index: 50; I/O Index: 250; Output Index: V-5 Maintains coordinated aileron & rudder pressures, maintains stabilator pressure
LL.	STOPS ROLL IN CLIMBING TURN Visual-Pitch att: constant Bank att: rolling Range landmarks Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Constant positive G, pitch constant, rolling	Determines proper pitch attitude & bank angle achieved	CR-4 MM R 1 C: VC, M; 2 Me: MC; 3 Mo: A Quantity: 3-C; Decision Proc: SP; Motor Output: St, Tr Input Index: 40; I/O Index: 80; Output Index: V-2 Coordinates aileron & rudder movement, maintains stabilator pressure
MM.	ESTABLISHES CLIMBING TURN Visual-Pitch att: constant Bank att: constant Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch constant, roll stabilized	Determines need for trim	CR-4g LL 255 1 C: V, CM; 2 Me: MC; 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: (Ai, Rd)/St Input Index: 55; I/O Index: 275; Output Index: V-5 Adjusts trim & relaxes stabilator pressure

NUCLEAR LOW ALTITUDE DROGUE DELIVERY/Controlled Range

SITUATION - Established straight and level, 3,500 feet AGL, 350 kts., approaching landmark 25 naut. miles from target, weapons switches set and confirmed with WSO, lead aircraft first pass, new event, headwind condition.



Nuclear low altitude drogue delivery maneuver diagram.

SITUATION Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

TASK NO. CR-5g TASK Nuclear Low Altitude Drogue Delivery AIRCRAFT F-4E

TASK GOAL Perform Visual LADD/Controlled Range DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	DEPARTS LAKE LANDMARK Visual-Pitch att: level Bank att: level Range landmarks Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Discerns landmark position & need to communicate (position & event) to range officer Sustains level flight	CR-5g A TASK NO. SKILL NO. 207 SEQ NO. 1 C: KIND V C; QUANTITY 2-C; INPUT INDEX 25 2 Me: INFO PROCESS SC (I); DECISION PROC SP; I/O INDEX 50 3 Mo: CONTINUITY A; MOTOR OUTPUT VB Ai CM St; OUTPUT INDEX V-2 Activates mic. button, communicates, maintains required aileron & stabilator pressure
B.	PREPARES DESCENT AT LAKE LANDMARK Visual-Pitch att: level Bank att: level Range landmarks Aural-Normal aircraft sound, communication Control-Aileron & stabilator pressure, mic. button function Motion-Normal G	Anticipates descent & increased airspeed Sustains level flight	CR-5g B TASK NO. SKILL NO. 42 SEQ NO. 1 C: KIND VA C; QUANTITY 3-C; INPUT INDEX 35 2 Me: INFO PROCESS MR (I); DECISION PROC SP; I/O INDEX 70 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai St; OUTPUT INDEX V-2 Maintains required aileron & stabilator control
C.	STARTS PITCH DECREASE Visual-Pitch att: level Bank att: level Range landmarks Flt.Inst: A/S & Alt. Aural-Chg. in aircraft sound, communication -(cleared in by range officer) Control-Aileron & stabilator pressure Motion-Normal G	Discerns position to begin descent	CR-5g C TASK NO. SKILL NO. 142 SEQ NO. 1 C: KIND VA O; QUANTITY 3-C; INPUT INDEX 45 2 Me: INFO PROCESS SC; DECISION PROC SP; I/O INDEX 90 3 Mo: CONTINUITY R; MOTOR OUTPUT St Th; OUTPUT INDEX V-2 Moves stabilator & throttle
D.	CONTINUES PITCH DECREASE Visual-Pitch att: decreasing Bank att: level Range landmarks Aural-Chg. in aircraft sound Control-Increased stabilator pressure, throttle advance Motion-Negative G onset, pitching down	Determines satisfactory pitch movement and power adjustment	CR-5g D TASK NO. SKILL NO. 276 SEQ NO. 1 C: KIND VA CM; QUANTITY A-C; INPUT INDEX 40 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INDEX 40 3 Mo: CONTINUITY R; MOTOR OUTPUT St; OUTPUT INDEX V-1 Maintains constant stabilator pressure

SITUATION Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

TASK NO. CR-5g TASK Nuclear Low Altitude Drogue Delivery AIRCRAFT F-4E

TASK GOAL Perform Visual LADD/Controlled Range DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	STOPS PITCH DECREASE Visual-Pitch att: decreasing Bank att: level Range landmarks Flt.Inst: cross-check Aural-Normal aircraft sound Control-Constant stabilator pressure Motion-Constant negative G, pitching down	Determines descent attitude approaching	CR-5g E 251 1 C: VC, M 2 Me: MC 3 Mo: A 3-C, CP, St 35, 35, V-1 Relaxes stabilator pressure
F.	CONTINUES DESCENT Visual-Pitch att: descent Bank att: level Range landmarks Aural-Normal aircraft sound, communication - WSO (range and bearing to target) Control-Decreased stabilator pressure Motion-Decreasing negative G, pitch stabilized	Determines need for trim	CR-5g E 17 1 C: VA, CM 2 Me: MC 3 Mo: A A-C, SP, Tr St 35, 70, V-2 Adjusts trim & relaxes stabilator pressure
G.	PREPARES RETURN TO LEVEL FLIGHT Visual-Pitch att: descent Bank att: level Range landmark(island) Aural-Normal aircraft sound Control-Neutral stabilator pressure, trim switch function Motion-Normal G	Anticipates return to level flight Sustains descent	CR-5g G 327 1 C: VC 2 Me: MP (I) 3 Mo: A 2-C, CP, Ai St 20, 40, V-2 Maintains required aileron & stabilator control
H.	STARTS PITCH INCREASE Visual-Pitch att: descent Bank att: level Range landmark(island) Flt.Inst: Alt. Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines altitude to return to level flight & position for communication (clearance to drop) to range officer	CR-5g H 267 1 C: VC 2 Me: MC 3 Mo: R 2-C, CP, St Ra CM 30, 60, V-2 Moves stabilator, activates mic. switch, communicates

SITUATION Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

TASK NO. CR-5g TASK Nuclear Low Altitude Drogue Delivery AIRCRAFT F-4E

TASK GOAL Perform Visual LADD/Controlled Range DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	CONTINUES PITCH INCREASE Visual-Pitch att: increasing Bank att: level Range landmark(island) Flt.Inst: cross-check Aural-Chg. in aircraft sound, communication - (clearance for the event) from range officer Control-Increased stabilator pressure, mic. switch function Motion-Positive G onset, pitching up	Determines satisfactory pitch movement	CR-5g I 276 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; St 50; 50; V-1 Maintains stabilator pressure
J.	STOPS PITCH INCREASE Visual-Pitch att: increasing Bank att: level Range landmark(island) Flt.Inst: A/S, Alt. Aural-Chg. in aircraft sound Control-Constant stabilator pressure Motion-Positive G, pitching up	Determines proper pitch attitude approaching	CR-5g J 276 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; St 45; 45; V-1 Relaxes stabilator pressure
K.	ESTABLISHES LEVEL FLIGHT Visual-Pitch att: increasing Bank att: level Range landmark(island) Flt.Inst: A/S, Alt. Armament panel Aural-Chg. in aircraft sound, communication - WSO (range and bearing to target) Control-Decreased stabilator pressure Motion-Decreasing positive G, pitch stabilizing	Determines need for trim & position for Master Arm on	CR-5g K 257 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; CP; St Ds 55; 110; V-2 Adjusts trim & relaxes stabilator pressure, activates Master Arm switch
L.	PREPARES APPROACH TO TARGET AREA Visual-Pitch att: level Bank att: level Sight/weapons lite:on Flt.Inst:HSI,A/S, Alt Aural-Normal aircraft sound Control-Neutral aileron, stabilator & rudder pressure, Master Arm switch function, trim switch function Motion-Normal G	Anticipates approach to target Sustains level flight	CR-5g L 327 1 C: VC; 2 Me: MR (I); 3 Mo: A 2-C; CP; Ai St 40; 90; V-2 Maintains required aileron & stabilator control

SITUATION Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

TASK NO. CR-5g **TASK** Nuclear Low Altitude Drogue Delivery **AIRCRAFT** F-4E

TASK GOAL Perform Visual LADD/Controlled Range **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	STARTS ROLL IN TO DESCENDING TURN Visual-Pitch att: level Bank att: level Sight/weapons lite Flt.Inst:HSI,A/S,Alt. Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines need for heading update, airspeed & altitude refinements	CR-5g M 270 1 C: VC; 2 Me: MC; 3 Mo: R Quantity: 2-C; Decision Proc: CP; Motor Output: Ai/Rd/St/Th Input Index: 40; I/O Index: 200; Output Index: V-5 Coordinates aileron & rudder with stabilator movement, adjusts throttle
N.	CONTINUES ROLL IN TO DESCENDING TURN Visual-Pitch att: decreasing Bank att: roll Flt.Inst: cross-check Aural-Chg. in aircraft sound Control-Increased aileron, stabilator & rudder pressure, throttle increase Motion-Negative G onset, pitching down, rolling	Determines satisfactory heading, altitude & airspeed change rate	CR-5g N 280 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: Ai/Rd/St/Th Input Index: 55; I/O Index: 275; Output Index: V-5 Maintains coordinated aileron, rudder & stabilator pressure, adjusts throttle
O.	STOPS ROLL TO DESCENDING TURN Visual-Pitch att: descent Bank att: roll Flt.Inst: cross-check Aural-Chg. in aircraft sound Control-Constant aileron, rudder & stabilator pressure, throttle increase Motion-Positive G onset, pitch stabilized, rolling	Determines proper heading, altitude, & airspeed change approaching	CR-5g O 290 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: Ai/Rd/St Input Index: 55; I/O Index: 275; Output Index: V-5 Coordinates aileron & rudder movements with increased stabilator pressure
P.	STARTS ROLL OUT AND RETURN TO LEVEL FLIGHT Visual-Pitch att: increasing Bank att: roll Flt.Inst: cross-check Aural-Normal aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Positive G, pitch increasing, rolling	Determines desired heading, altitude & airspeed to return to level flight	CR-5g P 275 1 C: VC M; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: Ai/Rd/St Input Index: 45; I/O Index: 225; Output Index: V-5 Coordinates (opposite) aileron & rudder movement with stabilator movement

SITUATION: Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

TASK NO. CR-5g TASK Nuclear Low Altitude Drogue Delivery AIRCRAFT F-4E

TASK GOAL Perform Visual LADD/Controlled Range DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Q.	CONTINUES ROLL OUT AND RETURN TO LEVEL FLIGHT Visual-Pitch att: increasing Bank att: roll Aural-Normal aircraft sound Control-Increased aileron, stabilator & rudder pressure Motion-Increased positive G, pitching up, rolling	Determines satisfactory pitch & roll rate	CR-5g Q 275 1 C: VC, M; 2 Me: MC; 3 Mo: R 3-C / CP / Al, Ru, St 40 / 200 / V-5 Maintains coordinated aileron & rudder pressure, relaxes stabilator pressure
R.	STOPS ROLL OUT AND RETURN TO LEVEL FLIGHT Visual-Pitch att: increasing Bank att: roll Flt.Inst:ADI,Alt,A/S Aural-Normal aircraft sound Control-Constant aileron & rudder, decreased stabilator pressure Motion-Decreased positive G, pitch & roll stabilized	Determines wings level approaching	CR-5g R R 1 C: VC, M; 2 Me: MC; 3 Mo: A 3-C / SP / Al, Ru, St 55 / 110 / V-2 Moves aileron, relaxes rudder & stabilator pressure
S.	ESTABLISHES LEVEL FLIGHT Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, decreased stabilator pressure Motion-Normal G	Determines need to search for 13,000' panels Sustains level flight	CR-5g S 287 1 C: VC; 2 Me: MC (I); 3 Mo: A 2-C / CP / Al, St 15 / 30 / V-2 Maintains required aileron & stabilator control
T.	STARTS FINAL APPROACH TO TARGET Visual-Pitch att: level Bank att: level Target IP Flt.Inst: A/S, Alt. Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Discerns target IP Sustains level flight	CR-5g T 207 1 C: VC; 2 Me: SC (I); 3 Mo: A 2-C / SP / Al, St, Ch 35 / 70 / V-2 Maintains required aileron & stabilator control, communicates - WSO

SITUATION: Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

TASK NO. CR-5g TASK: Nuclear Low Altitude Drogue Delivery AIRCRAFT: F-4E

TASK GOAL: Perform Visual LADD/Controlled Range DATE: Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
U.	CONTINUES FINAL APPROACH Visual-Pitch att: level Bank att: level Target IP Flt.Inst: A/S, Radar, Alt. Aural-Normal aircraft sound, communication - WSO *(calls airspeed & alt.) Control-Aileron & stabilator pressure Motion-Normal G	Determines need for final airspeed & altitude refinement	CR-5g U 272 1 C: VA C' / 3-C / 40 2 Mo: MC / CP / 80 3 Mo: R / Th Sc / V-2 Adjusts throttle, increases stabilator pressure
V.	CONTINUES APPROACH Visual-Pitch att: decreased Bank att: level Target IP Flt.Inst:A/S,Rdr,Alt. Aural-Chg. in aircraft sound *communication - WSO Control-Increased stabilator pressure, throttle advance Motion-Normal G	Determines proper altitude & airspeed & need for trim	CR-5g V 332 1 C: VA C' / 3-C / 35 2 Mo: MR (I) / CP / 70 3 Mo: A / A' Sc / V-2 Adjusts trim & relaxes stabilator pressure
W.	PREPARES ORDNANCE DELIVERY AND PULL UP Visual-Pitch att: level Bank att: level Target IP Flt.Inst:A/S,Rdr,Alt. Aural-Normal aircraft sound *communication - WSO Control-Neutral aileron, stabilator & rudder pressure, trim switch function Motion-Normal G	Anticipates pull up & ordnance delivery Sustains level flight	CR-5g V 252 1 C: VA C' / 3-C / 45 2 Mo: MC / CP / 90 3 Mo: A / Th Sc / V-2 Maintains required aileron & stabilator control
X.	STARTS ORDNANCE DELIVERY Visual-Pitch att: level Bank att: level Target IP Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Normal G	Discerns target ordnance release point Sustains level flight	CR-5g X 212 1 C: VA C' / 3-C / 30 2 Mo: SC (I) / SP / 60 3 Mo: A / Us A' St / V-2 Activates pickle button & maintains pressure Maintains required aileron & stabilator control

SITUATION: Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

TASK NO. CR-5g TASK Nuclear Low Altitude Drogue Delivery AIRCRAFT F-4E

TASK GOAL Perform Visual LADD/Controlled Range DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Y.	CONTINUES ORDNANCE DELIVERY Visual-Pitch att: level Bank att: level Target IP Aural-Normal aircraft sound, *communication - WSO weapons tone: on Control-Aileron & stabilator pressure, pickle button function Motion-Normal G	Discerns weapons tone and need to initiate smooth G pull	CR-5g Y 195 1 C: VA / C 2 Me: SC 3 Mo: R QUANTITY: 3-C DECISION PROC: SP MOTOR OUTPUT: SC / Th / Ds INPUT INDEX: 40 I/O INDEX: 200 OUTPUT INDEX: V-5 Maintains pickle button pressure, coordinates stabilator movement with throttle movement (to full mil.)
Z.	CONTINUES ORDNANCE DELIVERY Visual-Pitch att: increasing Bank att: level Flt.Inst: ADI *(pitch steering bar) Aural-Chg. in aircraft sound weapons tone: on Control-Increased stabilator pressure, throttle advance, pickle button function Motion-Positive G onset, pitching up	Determines weapons tone: on, and pitch steering bar satisfactory	CR-5g Z 402 1 C: VA / CM 2 Me: MC 3 Mo: R QUANTITY: 4C DECISION PROC: CP MOTOR OUTPUT: Ds / Sc INPUT INDEX: 50 I/O INDEX: 100 OUTPUT INDEX: V-2 Maintains pickle button pressure, maintains stabilator pressure
AA.	STOPS ORDNANCE DELIVERY Visual-Pitch att: increasing Bank att: level Flt.Inst: *ADI Pull up lite Aural-Chg. in aircraft sound weapons tone: on Control-Constant stabilator pressure, pickle button function Motion-Increased positive G, pitching up	Discerns weapons tone: off Sustains level climb	CR-5g AA 217 1 C: VA / CM 2 Me: SC / (I) 3 Mo: A QUANTITY: AC DECISION PROC: SP MOTOR OUTPUT: Ds / Th / Sc INPUT INDEX: 50 I/O INDEX: 100 OUTPUT INDEX: V-2 Deactivates pickle button, maintains required aileron & stabilator control

SITUATION: Established straight and level, 3,500 feet AGL, 350 knots, approaching landmark 25 naut. miles from target, weapons select switches set and confirmed with WSO, lead aircraft, first pass, new event, head wind condition.

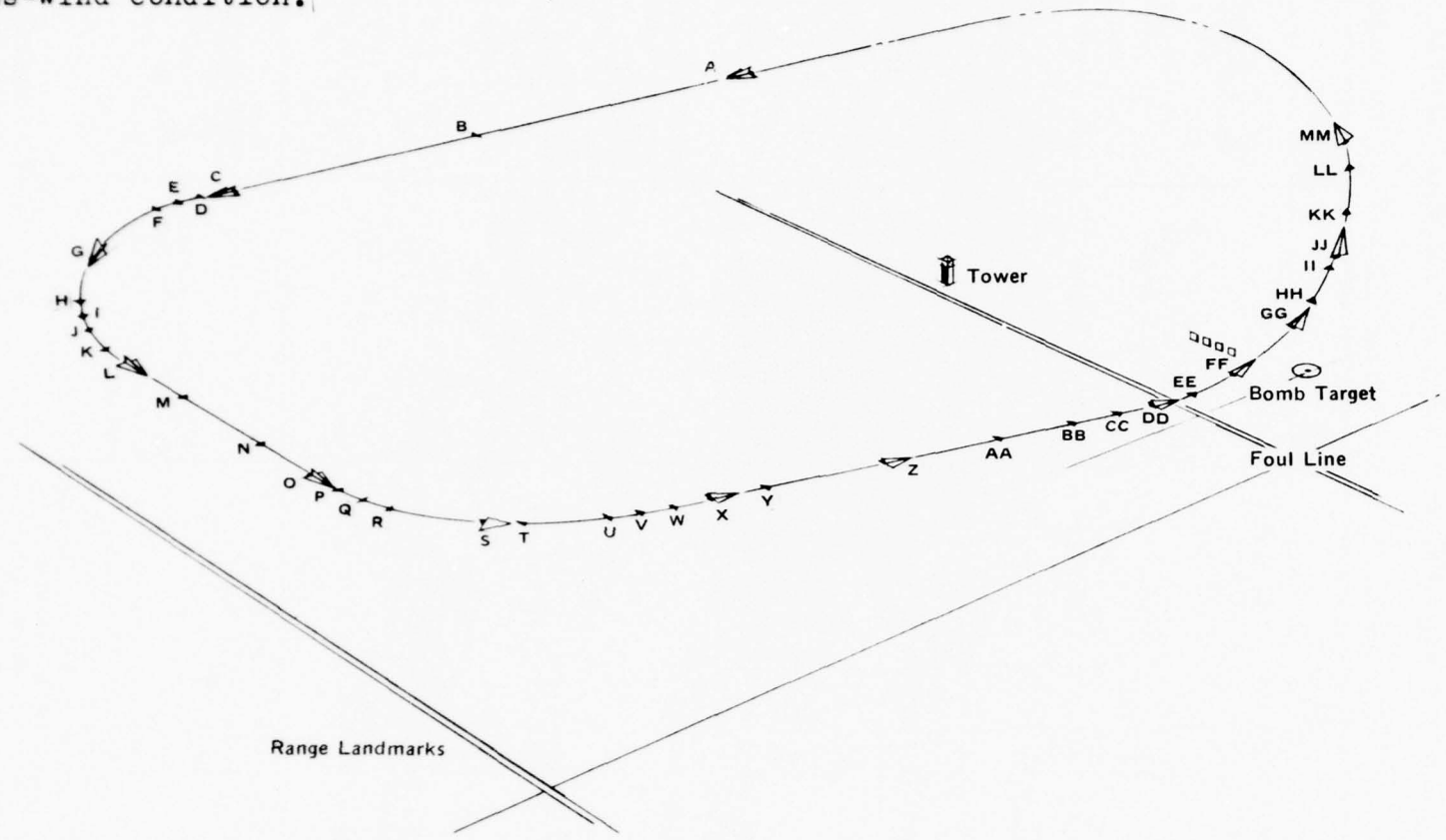
TASK NO. CR-5g TASK Nuclear Low Altitude Drogue Delivery AIRCRAFT F-4E

TASK GOAL Perform Visual LADD/Controlled Range DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
BB.	STARTS ROLL IN TO CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: level Range landmarks Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure, pickle button function Motion-Constant positive G, pitch stabilized	Determines position to begin roll in & call ("off wet", simulated escape) to range officer	CR-5g BB 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, Rv, St, Cm INPUT INDEX: 45; I/O INDEX: 225; OUTPUT INDEX: V-5 Coordinates aileron & rudder movement with relaxed stabilator pressure, activates mic. switch, communicates
CC.	CONTINUES ROLL TO CLIMBING TURN Visual-Pitch att: decreasing Bank att: roll Range landmarks Aural-Chg. in aircraft sound, communication Control-Increased aileron & rudder pressure, reduced stabilator pressure, mic. switch function Motion-Decreasing positive G, pitch decreasing, rolling	Determines satisfactory pitch attitude & roll rate	CR-5g CC 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, Rv, St INPUT INDEX: 60; I/O INDEX: 300; OUTPUT INDEX: V-5 Maintains coordinated aileron & rudder pressure, maintains stabilator pressure
DD.	STOPS ROLL TO CLIMBING TURN Visual-Pitch att: constant Bank att: roll Range landmarks Flt.Inst: cross-check Aural-Normal aircraft sound Control-Constant aileron, stabilator & rudder pressure Motion-Constant positive G, pitch stabilized, rolling	Determines desired pitch & proper bank attitude approaching	CR-5g DD 255 1 C: VC, M; 2 Me: MC; 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai, Rv, St INPUT INDEX: 50; I/O INDEX: 250; OUTPUT INDEX: V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
EE.	ESTABLISHES CLIMBING TURN Visual-Pitch att: constant Bank att: constant Range landmarks Aural-Normal aircraft sound, communication - range officer(calls bomb plot) Control-Neutral aileron & rudder, constant stabilator pressure Motion-Constant positive G, pitch constant, roll stabilized	Discerns communication Sustains climbing turn	CR-5g EE 247 1 C: VA, CM; 2 Me: SC, ED; 3 Mo: A QUANTITY: 4-C; DECISION PROC: SP; MOTOR OUTPUT: Ai, St INPUT INDEX: 40; I/O INDEX: 80; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control

LOW ANGLE DIVE BOMB DELIVERY/Controlled Range

SITUATION - Established on downwind, straight and level, 3,500 feet AGL, 400 kts., weapons select switches set and confirmed with WSO, second aircraft, first pass, new event, cross-wind condition.



Low angle dive bomb maneuver diagram.

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED ON DOWNWIND TO TARGET Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines proper spacing from lead & distance from target Sustains level flight	CR-6g A 287 1 C: VC; 2 Me: MC (I); 3 Mo: A QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St INPUT INDEX: 35; I/O INPUT: 70; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
B.	CONTINUES DOWNWIND Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: A/S, Alt Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines base roll in position approaching Sustains level flight	CR-6g B 287 1 C: VC; 2 Me: MC (I); 3 Mo: A QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St INPUT INDEX: 45; I/O INPUT: 90; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
C.	PREPARES TURN TO BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Anticipates roll in to base leg Sustains level flight	CR-6g C 327 1 C: VC; 2 Me: MC (I); 3 Mo: A QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St INPUT INDEX: 35; I/O INPUT: 70; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
D.	STARTS ROLL IN TO BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication (leading aircraft cleared in hot by range officer) Control-Aileron & stabilator pressure Motion-Normal G	Determines position to roll in to base & maintain proper spacing	CR-6g D 275 1 C: VA C; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai Rd St INPUT INDEX: 40; I/O INPUT: 200; OUTPUT INDEX: V-5 Coordinates aileron & rudder movement with stabilator pressure

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES ROLL IN Visual-Pitch att: increasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Increased aileron, stabilator & rudder pressure Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate & need for power	CR-6g TASK NO. E SKILL NO. 280 SLOT NO. 1 C: KIND VA CM; QUANTITY 4C; INPUT INDEX 60 2 Me: INFO PROCESS MC; DECISION PROC CP; I/O INPUT 300 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai Ru St Th; OUTPUT INDEX V-5 Maintains coordinated aileron & rudder pressure, increases stabilator pressure, adjusts throttle
F.	STOPS ROLL Visual-Pitch att: increasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron & rudder, increased stabilator pressure, throttle advance Motion-Increasing positive G, pitching up, rolling	Determines proper bank attitude approaching	CR-6g TASK NO. F SKILL NO. 20 SLOT NO. 1 C: KIND VC AM; QUANTITY 4-C; INPUT INDEX 65 2 Me: INFO PROCESS MC; DECISION PROC SP; I/O INPUT 325 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai Ru St; OUTPUT INDEX V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
G.	ESTABLISHED IN TURN TO BASE Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder, constant stabilator pressure, Motion-Constant positive G, pitch & roll stabilized	Determines need to communicate (position & fuel to range officer) Sustains level turn	CR-6g TASK NO. G SKILL NO. 242 SLOT NO. 1 C: KIND VC M; QUANTITY 3-C; INPUT INDEX 45 2 Me: INFO PROCESS MC (I); DECISION PROC CP; I/O INPUT 90 3 Mo: CONTINUITY A; MOTOR OUTPUT Ai Ds St Cm; OUTPUT INDEX V-2 Activates mic. button, communicates, maintains required aileron & stabilator control

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
H.	PREPARES ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication Control-Aileron & stabilator pressure, mic. switch function Motion-Constant positive G, pitch & roll constant	Anticipates roll out to base Sustains turn	CR-6g H 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A 4-C; CP; Ai Sc 60; 120; V-2 Maintains required aileron & stabilator control
I.	STARTS ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Determines position to roll out to base for spacing and distance from target	CR-6g I 275 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai Ru Sc 50; 250; V-5 Coordinates aileron & rudder with stabilator movement
J.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron, stabilator & rudder pressure Motion-Decreasing positive G, pitch decreasing, rolling	Determines satisfactory roll rate & need to reduce power	CR-6g J 275 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai Ru Sc Th 55; 275; V-5 Maintains coordinated aileron & rudder pressure, relaxes stabilator pressure, adjusts power
K.	STOPS ROLL Visual-Pitch att: decreasing Bank att: rolling Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure, throttle reduction Motion-Decreasing positive G, pitch decreasing, rolling	Determines wings level approaching	CR-6g K 17 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; SP; Ai Ru Sc 65; 130; V-2 Moves aileron & rudder, relaxes stabilator pressure

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
L.	ESTABLISHES LEVEL FLIGHT ON BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder, decreased stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines need to adjust altitude & airspeed for proper spacing	CR-6g L 272 1 C: VC M; 3-C; 60 2 Me: MC; CP; 100 3 Mo: R; St Th; V-2 Decreases stabilator pressure, & adjusts throttle
M.	CONTINUES BASE LEG Visual-Pitch att: decreasing Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound Control-Increased stabilator pressure, throttle reduction Motion-Normal G, pitching down	Determines proper altitude, airspeed & spacing approaching	CR-6g M 256 1 C: VA CM; 4-C; 55 2 Me: MC; CP; 65 3 Mo: A; St; V-1 Increases stabilator pressure
N.	CONTINUES ON BASE Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Increased stabilator pressure Motion-Positive G, pitch stabilized	Determines proper altitude, airspeed, & track; need to trim & communicate (position in to range officer)	CR-6g N 252 1 C: VC M; 3-C; 50 2 Me: MC; CP; 100 3 Mo: A; St Rt Trim; V-2 Activates mic. button, communicates, adjusts trim & relaxes stabilator pressure
O.	PREPARES TURN TO FINAL Visual-Pitch att: level Bank att: level Target Range landmarks Aural-Normal aircraft sound, communication (clearance from range officer) Control-Neutral stabilator pressure, mic. switch function, trim switch function Motion-Normal G	Anticipates roll in and dive Sustains level flight	CR-6g O 327 1 C: V C; 1-C; 35 2 Me: MR (I); CP; 70 3 Mo: A; St; V-2 Maintains required aileron & stabilator pressure

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
P.	STARTS ROLL IN AND DIVE Visual-Pitch att: level Bank att: level Target Range landmarks Aural-Normal aircraft sound Control-Aileron & stabilator control Motion-Normal G	Determines position to roll in to final & need for power	CR-6g P 270 1 C: VC; 2 Me: MC; 3 Mo: R QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: SA' RU St Th INPUT INDEX: 30; I/O INPUT: 150; OUTPUT INDEX: V-5 Coordinates aileron & rudder movement, maintains stabilator pressure, moves throttle
Q.	CONTINUES ROLL IN AND DIVE Visual-Pitch att: level Bank att: roll Target Aural-Chg. in aircraft sound Control-Increased aileron & rudder pressure, constant stabilator pressure, throttle advance Motion-Positive G onset, rolling	Determines satisfactory roll rate & need to begin to establish dive	CR-6g Q 280 1 C: VA CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: SA' RU St INPUT INDEX: 50; I/O INPUT: 250; OUTPUT INDEX: V-5 Maintains coordinated aileron & rudder pressure, relaxes stabilator pressure
R.	STOPS ROLL IN AND DIVE Visual-Pitch att: decreasing Bank att: roll Target Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure Motion-Positive G, pitching down, rolling	Determines proper roll and dive attitude achieved	CR-6g R 260 1 C: VA CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: SA' RU St INPUT INDEX: 50; I/O INPUT: 250; OUTPUT INDEX: V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
S.	ESTABLISHES DIVING TURN Visual-Pitch att: descent (constant) Bank att: constant Target Aural-Chg. in aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Positive G, pitch & roll stabilized	Sustains descending turn	CR-6g S 137 1 C: VA CM; 2 Me: I; 3 Mo: A QUANTITY: 4C; DECISION PROC: SP; MOTOR OUTPUT: A' St INPUT INDEX: A0; I/O INPUT: 80; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
T.	PREPARES ROLL OUT ON FINAL Visual-Pitch att: constant Bank att: constant Target Aural-Chg. in aircraft sound Control-Aileron, stabilator & rudder pressure Motion-Positive G, pitch & roll constant	Anticipates roll out to final dive Sustains descending turn	CR-6g T 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A 4-C; CP; Ai St 50; 100; V-2 Maintains required aileron & stabilator control
U.	STARTS ROLL OUT, MAINTAINS DIVE Visual-Pitch att: constant Bank att: constant Target Sight Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Positive G, pitch & roll constant	Determines proper position to roll out to final with satisfactory dive angle	CR-6g U 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Ru St 50; 250; V-5 Coordinates aileron & rudder, maintains stabilator pressure
V.	CONTINUES ROLL OUT, MAINTAINS DIVE Visual-Pitch att: constant Bank att: roll Target Sight Aural-Chg. in aircraft sound Control-Increased aileron & rudder, constant stabilator pressure Motion-Positive G, pitch constant, rolling	Determines satisfactory roll out rate & need to reduce power	CR-6g V 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai St Ru Th 50; 250; V-5 Maintains coordinated aileron & rudder pressure, constant stabilator pressure, moves throttle
W.	STOPS ROLL, MAINTAINS DIVE Visual-Pitch att: constant Bank att: roll Target Sight Aural-Chg. in aircraft sound Control-Constant aileron & rudder, constant stabilator pressure, throttle reduced Motion-Decreasing positive G, pitch constant, rolling	Determines wings level achieved	CR-6g W 357 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; CP; Ai St 60; 120; V-2 Moves aileron & rudder, maintains stabilator pressure

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
X.	ESTABLISHED ON FINAL APPROACH TO THE TARGET Visual-Pitch att: constant (nose low) Bank att: level Target Sight Flt.Inst: ADI,A/S,Alt Aural-Chg. in aircraft sound Control-Increased aileron & rudder, constant stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines proper airspeed, altitude, & dive angle approaching; & need for trim	CR-6g X 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A Quantity: A-C; Decision Proc: CP; Motor Output: Th, St Input Index: 65; I/O Input: 130; Output Index: V-2 Adjusts trim, maintains stabilator pressure
Y.	PREPARES FINAL APPROACH AND PULL UP Visual-Pitch att: constant (descent) Bank att: level Target Sight Aural-Chg. in aircraft sound, communication - WSO *(dive angle, A/S, Alt) Control-Neutral aileron, rudder & stabilator pressure, trim switch function Motion-Normal G,	Anticipates delivery & pull up Sustains level dive	CR-6g Y 257 1 C: VA, C; 2 Me: MR (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai, St Input Index: 35; I/O Input: 70; Output Index: V-2 Maintains required aileron and stabilator control
Z.	STARTS FINAL APPROACH TO TARGET Visual-Pitch att: descent Bank att: level Target/pipper Flt.Inst: A/S, Alt Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Normal G,	Determines need for crab delivery & to refine dive angle	CR-6g Z 257 1 C: VA, C; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: Ru, St, Ai Input Index: 45; I/O Input: 90; Output Index: V-2 Increases required rudder, stabilator & aileron pressure
AA.	CONTINUES FINAL APPROACH Visual-Pitch att: decreasing Bank att: level Target/pipper Aural-Chg. in aircraft sound *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Normal G,	Determines dive refinement & proper crab approaching	CR-6g AA 252 1 C: VA, C; 2 Me: MC; 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ru, St, Ai Input Index: 40; I/O Input: 80; Output Index: V-2 Relaxes required rudder, stabilator & aileron pressure

SITUATION Aircraft established on downwind, level, 3500' AGL 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
BB.	CONTINUES FINAL APPROACH Visual-Pitch att:stabilizing Bank att: level Target/pipper Flt.Inst: ADI,Alt,A/S Aural-Chg. in aircraft sound *communication - WSO Control-Decreased aileron, stabilator & rudder pressure Motion-Normal G, pitch constant	Determines proper dive solution	CR-6g BB 257 1 C: VA, C-M; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: Ai Sc Rv Input Index: 65; I/O Input: 130; Output Index: V-2 Maintains aileron, stabilator & rudder pressure
CC.	CONTINUES FINAL APPROACH Visual-Pitch att: dive stabilized Bank att: level Target/pipper Aural-Normal aircraft sound, *communication - WSO Control-Aileron, rudder, & stabilator pressure Motion-Normal G, pitch constant	Determines proper tracking solution approaching Sustains level dive	CR-6g CC 297 1 C: VA, C-M; 2 Me: MC (I); 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: Ai Sc Rv Input Index: 45; I/O Input: 90; Output Index: V-2 Maintains required aileron, stabilator, & rudder pressure
DD.	CONTINUES FINAL APPROACH Visual-Pitch att: constant Bank att: level Target/pipper Aural-Normal aircraft sound, *communication - WSO Control-Aileron, stabilator, & rudder pressure Motion-Normal G,	Determines proper tracking solution (pipper/target relation) Sustains level dive	CR-6g DD 297 1 C: VA, C; 2 Me: MC (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai Sc Rv Input Index: 40; I/O Input: 80; Output Index: V-2 Maintains required aileron, stabilator & rudder pressure
EE.	RELEASES ORDNANCE Visual-Pitch att: constant Bank att: level Target/pipper Aural-Normal aircraft sound, communication - WSO (calls pickle alt.) Control-Minimum aileron, stabilator & rudder pressure Motion-Normal G,	Determines pickle position Sustains level dive	CR-6g EE 297 1 C: VA, C; 2 Me: MC (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai Sc Rv Ds Input Index: 40; I/O Input: 80; Output Index: V-2 Maintains aileron, stabilator & rudder pressure; activates pickle button

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

TASK NO. CR-6g **TASK** Low Angle Dive Bomb/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
FF.	STARTS OFF TARGET PULL UP Visual-Pitch att: constant Bank att: level Target Aural-Normal aircraft sound Control-Minimum aileron, stabilator & rudder pressure, pickle button function Motion-Normal G,	Determines need to initiate smooth G pull	CR-6g FF 32 1 C: VC M / 3-C / 35 2 Me: MC / SP / 10 3 Mo: R / St Rv / V-2 Moves stabilator and rudder
GG.	CONTINUES PULL UP Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Increased stabilator & rudder pressure Motion-Positive G onset, pitching up	Determines satisfactory pitch movement rate & need for power	CR-6g GG 227 1 C: VA C M / A-C / A5 2 Me: MC / CP / 90 3 Mo: R / St Th / V-2 Maintains stabilator pressure & throttle movement
HH.	STOPS PULL UP TO CLIMBING TURN Visual-Pitch att: increasing Bank att: level Range landmarks Aural-Chg. in aircraft sound Control-Constant stabilator pressure, throttle advance Motion-Increasing positive G, pitching up	Determines proper pitch attitude approaching	CR-6g HH 256 1 C: VA C M / A-C / 40 2 Me: MC / CP / 40 3 Mo: A / St / V-1 Relaxes stabilator pressure
II.	PREPARES TRANSITION TO CLIMBING TURN Visual-Pitch att: climb (constant) Bank att: level Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Decreased stabilator pressure Motion-Decreasing positive G, pitch stabilized	Anticipates climbing turn Sustains level climb	CR-6g II 42 1 C: VC M / 3-C / 35 2 Me: MR (I) / SP / 70 3 Mo: A / St / V-2 Maintains required aileron, stabilator & rudder control

SITUATION Aircraft established on downwind, level, 3500' AGL, 400 knots, weapons select switches set and confirmed, second aircraft, 1st pass, new event, cross wind condition.

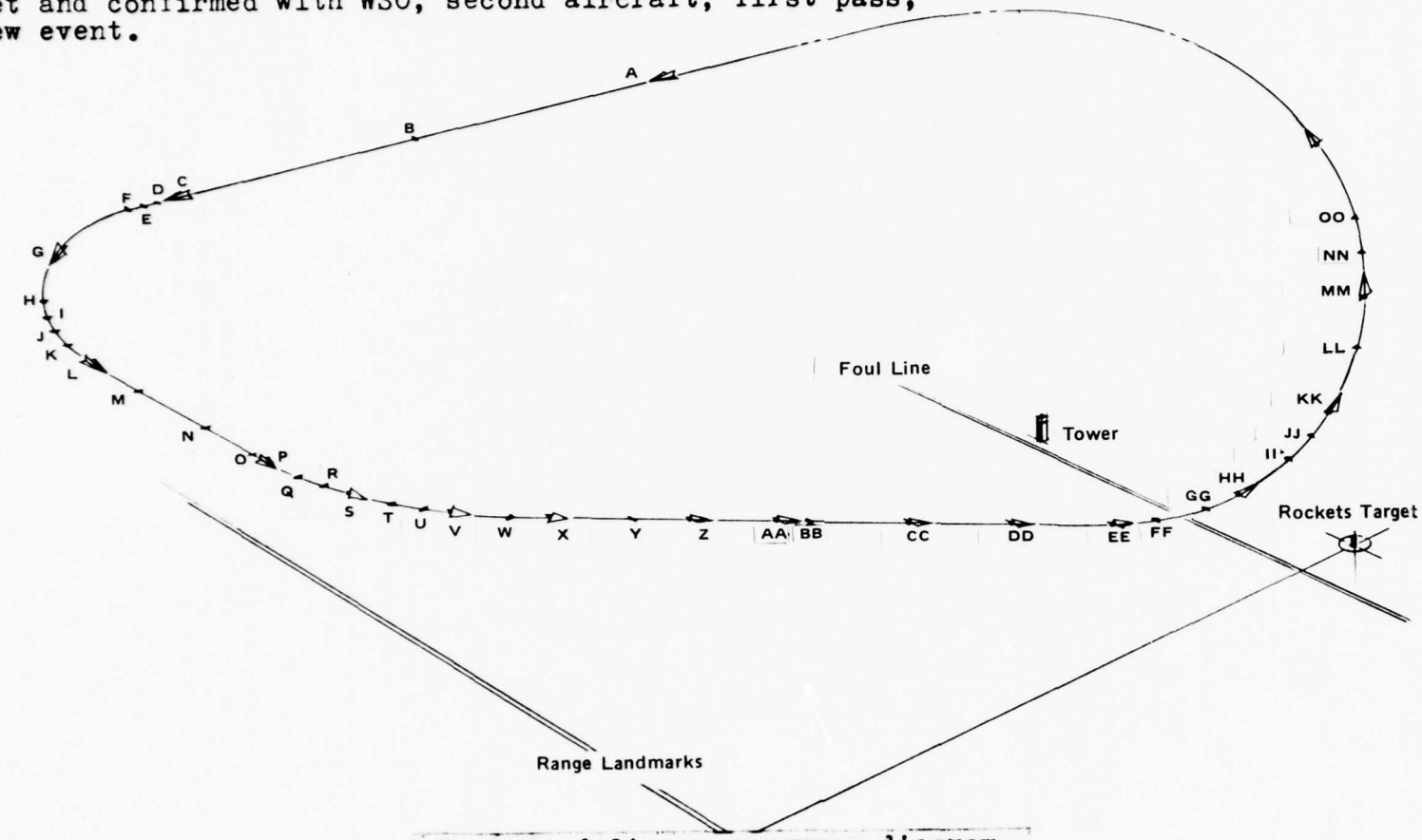
TASK NO. CR-6g TASK Low Angle Dive Bomb/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Range, Low Angle Dive Bomb Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
JJ.	STARTS ROLL IN TO CLIMBING TURN Visual-Pitch att: constant Bank att: level Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Decreased stabilator pressure Motion-Decreasing positive G pitch constant	Determines desired pitch attitude & position to begin roll, need for trim	CR-6g JJ 275 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai Ru Tr St 40; 200; V-S Coordinates aileron & rudder movement, adjusts trim & relaxes stabilator pressure
KK.	CONTINUES ROLL IN CLIMBING TURN Visual-Pitch att: constant Bank att: rolling Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder, decreased stabilator pressure, trim function Motion-Constant positive G, pitch constant, rolling	Determines proper pitch attitude & satisfactory roll rate/turn for proper spacing	CR-6g KK 275 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai Ru St 55; 275; V-S Maintains coordinated aileron & rudder pressure, maintains stabilator pressure
LL.	STOPS ROLL IN CLIMBING TURN Visual-Pitch att: constant Bank att: rolling Range landmarks Leading aircraft Flt.Inst:cross-check Aural-Normal aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Constant positive G, pitch constant, rolling	Determines desired pitch attitude & proper bank angle approaching	CR-6g LL 15 1 C: VC M; 2 Me: MC; 3 Mo: A 3-C; SP; Ai Ru St 55; 275; V-S Coordinates aileron & rudder movement, maintains stabilator pressure
MM.	ESTABLISHES CLIMBING TURN Visual-Pitch att: constant Bank att: constant Range landmarks Leading aircraft Aural-Normal aircraft sound, communication - WSO Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch constant, roll stabilized	Determines need for trim, communication-WSO (bomb plot)	CR-6g MM 17 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; SP; St Tr 45; 90; V-2 Adjusts trim & relaxes stabilator pressure

ROCKETS DELIVERY - 30° DIVE/Controlled Range

SITUATION - Established on downwind, straight and level, 7,000 feet AGL, 300 - 350 kts., weapons select switches set and confirmed with WSO, second aircraft, first pass, new event.



Rockets delivery maneuver diagram.

SITUATION Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g **TASK** 30° Rockets Delivery/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Rocket Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED ON DOWNWIND LEG TO TARGET Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines proper spacing with desired Alt. & A/S approaching Sustains level flight	CR 7g / A / 287 1 C: VC; 2 Mo: MC (I); 3 Mo: A Quantity: 2 C; Decision Proc: CP; Motor Output: Ai Sc Input Index: 45; I/O Input: 90; Output Index: V-2 Maintains required aileron & stabilator control
B.	CONTINUES ON DOWNWIND LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines base leg roll in position & need for proper Alt. & A/S Sustains level flight	CR 7g / B / 287 1 C: V C; 2 Mo: MC (I); 3 Mo: A Quantity: 2-C; Decision Proc: CP; Motor Output: Sc Input Index: 45; I/O Input: 90; Output Index: V-2 Adjusts throttle, maintains aileron and stabilator control
C.	PREPARES FOR TURN TO BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication - (lead calling in on final) Control-Constant stabilator pressure, increased throttle pressure Motion-Normal G	Anticipates roll in to base leg turn, discerns leading aircraft communication Sustains level flight	CR 7g / C / 332 1 C: VA C; 2 Mo: MR (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Ai Sc Input Index: 40; I/O Input: 80; Output Index: V-2 Maintains required aileron & stabilator pressure
D.	STARTS ROLL IN TO BASE LEG TURN Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines position to start turn to base leg & need to make position check to range officer	CR- / D / 270 1 C: VC; 2 Mo: MC; 3 Mo: R Quantity: 2-C; Decision Proc: CP; Motor Output: Ai Sc Rv / Ds Cm Input Index: 35; I/O Input: 175; Output Index: V-5 Coordinates aileron, rudder & stabilator movement; activates mic. switch & communicates

SITUATION Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g **TASK** 30° Rockets Delivery/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Rocket Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES ROLL IN TO BASE LEG Visual-Pitch att: increasing Bank att: roll Target Range landmarks Leading aircraft Aural-Normal aircraft sound, communication Control-Increased aileron, rudder & stabilator pressure, mic. switch function Motion-Positive G onset, pitching up, rolling	TURN Determines roll rate satisfactory & need for power	CR-7g E 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R 4-C; CP; SA/RU/ST 65; 325; V-5 Maintains coordinated aileron & rudder pressure, increased stabilator pressure, adjusts throttle
F.	STOPS ROLL IN Visual-Pitch att: increasing Bank att: roll Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron, increased stabilator pressure, throttle advance Motion-Increasing positive G, pitching up, rolling	Determines proper bank attitude achieved to provide proper distance (target to base leg)	CR7g F 260 1 C: VA, CM; 2 Me: MC; 3 Mo: A 4-C; CP; SA/RU/ST 60; 300; V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
G.	ESTABLISHES TURN Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Sustains level turn	CR7g G 272 1 C: VC, M; 2 Me: I; 3 Mo: A 3-C; CP; AI ST 45; 90; V-2 Maintains required aileron & stabilator control
H.	PREPARES TO ROLL OUT Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator control Motion-Constant positive G, constant pitch & roll	Anticipates roll out to base leg Sustains level turn	CR7g H 332 1 C: VC, M; 2 Me: MR (I); 3 Mo: A 3-C; CP; AI ST 50; 100; V-2 Maintains required aileron & stabilator control

SITUATION Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g **TASK** 30° Rockets Delivery/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Rocket Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	STARTS ROLL OUT OF TURN Visual-Pitch att: constant Bank att: constant Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Constant aileron & rudder, constant stabilator pressure Motion-Constant positive G, constant pitch & roll	Determines position to roll out on base leg to establish proper distance to target relationship	CR-7g / I / 275 1 C: VC, M; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: Ai, Rv, St Input Index: 55; I/O Input: 275; Output Index: V-5 Coordinates aileron & rudder; relaxes stabilator pressure
J.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: roll Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron & rudder, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines satisfactory roll rate & need to reduce power	CR-7g / J / 275 1 C: VC, M; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: Ai, Rv, St, Th Input Index: 65; I/O Input: 275; Output Index: V-5 Maintains coordinated aileron & rudder with stabilator movement, adjusts throttle
K.	STOPS ROLL OUT Visual-Pitch att: decreasing Bank att: roll Target Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure, throttle reduction Motion-Decreasing positive G, pitching down, rolling	Determines wings level approaching	CR-7g / K / 17 1 C: VA, CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: SP; Motor Output: Ai, Rv, St Input Index: 65; I/O Input: 130; Output Index: V-2 Moves aileron & rudder, relaxes stabilator pressure
L.	ESTABLISHES LEVEL FLIGHT ON BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, decreased stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines level flight established & need to adjust altitude & airspeed	CR-7g / L / 32 1 C: VC, M; 2 Me: MC; 3 Mo: 2 Quantity: 3-C; Decision Proc: SP; Motor Output: St, Th Input Index: 50; I/O Input: 100; Output Index: V-2 Increases stabilator pressure and adjusts throttle

SITUATION Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g **TASK** 30° Rockets Delivery/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Rocket Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	CONTINUES BASE LEG Visual-Pitch att: increasing Bank att: level Target Range landmarks Leading aircraft Aural-Chg.in aircraft sound Control-Increased stabilator pressure, throttle reduction Motion-Normal G, pitching down	Determines proper altitude, airspeed & pattern spacing approaching	CR-7g M 256 1 C: VC, AM; 2 Me: MC; 3 Mo: A 4-C; CP; St 45; 45; V-1 Decreases stabilator pressure
N.	CONTINUES ON BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G, pitch stabilized	Determines proper altitude, airspeed, & track; need for trim	CR-7g N 252 1 C: VC, M; 2 Me: MC; 3 Mo: A 3-C; CP; Tr, St 40; 80; V-2 Adjusts trim & relaxes stabilator pressure
O.	CONTINUES ON BASE LEG Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Neutral aileron, stabilator & rudder pressure, trim switch function Motion-Normal G	Determines final roll in position approaching & need to check armament switches Sustains level flight	CR-7g O 287 1 C: VC; 2 Me: MC (I); 3 Mo: A 2-C; CP; Ai, St 30; 60; V-2 Maintains required aileron & stabilator control
P.	PREPARES TO TURN TO FINAL Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Armament panel Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Anticipates roll in and dive on final Sustains level flight	CR-7g P 327 1 C: VC; 2 Me: MR (I); 3 Mo: A 2-C; CP; Ai, St 40; 80; V-2 Maintains required aileron & stabilator control

SITUATION: Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g TASK 30° Rockets Delivery/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Rocket Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Q.	STARTS ROLL IN TO FINAL Visual-Pitch att: level Bank att: level Target Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Aileron, stabilator & rudder pressure Motion-Normal G	Determines proper position to start roll in & need to call position to range officer	CR-7g Q 270 1 C: VC; 2 Me: MC; 3 Mo: R 2-C; CP; Ai/Rv/Rr/Sr/Sm 40; 200; V-S Coordinates aileron & rudder movement, maintains stabilator pressure, activates mic. button, communicates
R.	CONTINUES ROLL IN TO TURN Visual-Pitch att: increasing Bank att: roll Target Range landmarks Aural-Chg. in aircraft sound, communication- (clearance from range officer to launch rockets) Control-Increased aileron & rudder pressure, constant stabilator pressure, mic. switch function Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate	CR-7g R 269 1 C: VA OM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai/Rv/St 65; 260; V-A Maintains coordinated aileron, rudder & stabilator pressure
S.	STOPS ROLL IN TO TURN Visual-Pitch att: increasing Bank att: roll Target Aural-Chg. in aircraft sound, communication Control-Constant aileron & rudder pressure, constant stabilator pressure Motion-Increased positive G, pitching up, rolling	Determines proper bank angle achieved	CR-7g S 260 1 C: VA OM; 2 Me: MC; 3 Mo: A 4-C; CP; Ai/Rv/St 55; 275; V-S Coordinates aileron & rudder, maintains stabilator pressure

SITUATION Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g **TASK** 30° Rockets Delivery/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform Rocket Delivery **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
T.	LOWERS NOSE HALFWAY THROUGH TURN Visual-Pitch att: constant Bank att: constant Target Range landmarks Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Increased positive G, pitch & roll stabilized	Determines halfway point in turn reached & need to lower nose & reduce power to planned power setting	CR-7g T 272 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai Sc R Th 40; 80; V-2 Maintains required aileron & rudder control, relaxes stabilator pressure, adjusts throttle
U.	ESTABLISHES DIVING TURN Visual-Pitch att: decreasing Bank att: constant Target Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure, throttle reduction Motion-Decreasing positive G, pitching down, roll stabilized	Determines need to have minimum alt. loss during turn Sustains turn	CR-7g U 317 1 C: VA CM; 2 Me: MC (I); 3 Mo: R 4-C; CP; Ai R Sc 55; 110; V-2 Maintains required aileron & rudder, stops stabilator movement
V.	CONTINUES TURN WITH NOSE DESCENDING SLOWLY Visual-Pitch att: decreasing Bank att: roll Target Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound Control-Aileron & rudder pressure, constant stabilator pressure Motion-Positive G, pitching down, roll stabilized	Determines altitude & airspeed schedule is as required (nose descending at desired rate) Sustains descending turn	CR-7g V 317 1 C: VA CM; 2 Me: MC (I); 3 Mo: R 4-C; CP; Ai Sc 45; 90; V-2 Maintains required aileron & stabilator pressure
W.	PREPARES TO ROLL OUT WINGS LEVEL ON FINAL Visual-Pitch att: decreasing Bank att: roll Target Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Positive G, pitching down, roll stabilized	Anticipates rolling out wings level (greater than 30° dive angle & pipper pointed at target-short) Sustains descending turn	CR-7g W 357 1 C: VA CM; 2 Me: MR (I); 3 Mo: R 4-C; CP; Ai Sc 45; 90; V-2 Maintains required aileron & stabilator pressure

SITUATION Aircraft established on downwind at 7000' AGL 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g TASK 30° Rockets Delivery/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Rocket Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
X.	STARTS ROLL OUT Visual-Pitch att: dive Bank att: constant Target Sight Aural-Chg. in aircraft sound, communication - WSO Control-Aileron & stabilator pressure Motion-Positive G, pitching down, roll stabilized	Determines position to start roll out to have aircraft pointed at target	CR-7g X 279 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; SA Ru St 55; 220; V-4 Coordinates aileron, rudder & stabilator pressure
Y.	CONTINUES ROLL OUT TO FINAL Visual-Pitch att: dive Bank att: rolling Target Sight Aural-Chg. in aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Decreasing positive G, constant pitch, rolling	Determines proper roll out rate, dive angle, & alignment with target approaching	CR-7g Y 279 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; SA St Ru 55; 220; V-4 Maintains coordinated aileron, rudder & stabilator pressure
Z.	STOPS ROLL OUT Visual-Pitch att: dive Bank att: rolling Target Sight Flt.Inst: Alt,A/S,ADI Aural-Chg. in aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines wings level attitude approaching & aircraft pointed at target	CR-7g Z 257 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; CP; Ai Ru St 70; 140; V-2 Moves aileron & rudder, maintains stabilator pressure
AA.	ESTABLISHES FINAL APPROACH CONDITIONS Visual-Pitch att: dive Bank att: level Target Sight Flt.Inst: Alt,A/S, ADI Aural-Chg. in aircraft sound, communication - WSO *(calls Alt,A/S & Dive) Control-Increased aileron & rudder pressure, constant stabilator pressure Motion-Normal G, pitch & roll stabilized	Determines proper dive angle & airspeed approaching, & need to adjust trim	CR-7g AA 257 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; CP; Ru St 70; 140; V-2 Adjusts trim & maintains stabilator pressure

SITUATION: Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g TASK 30° Rockets Delivery/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Rocket Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
BB.	PREPARES TO TRACK TARGET AND LAUNCH ROCKETS Visual-Pitch att: constant Bank att: level Target/pipper Flt.Inst: Alt,A/S,ADI Aural-Normal aircraft sound, *communication - WSO Control-Constant stabilator pressure, neutral aileron & rudder pressure, trim switch function Motion-Normal G	Determines proper drift rate of pipper towards target & release altitude approaching	CR-7g BB 252 1 C: VA C; 2 Me: MC; 3 Mo: A 3-C; CP; Ai/St/RV 45; 90; V-2 Maintains required aileron, rudder & stabilator pressure
CC.	CONTINUES ON FINAL TOWARDS RELEASE CONDITIONS Visual-Pitch att: dive Bank att: level Target/pipper Flt.Inst: Alt, A/S Aural-Normal aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Anticipates rocket release conditions, recovery, & pull up Sustains dive	CR-7g CC 332 1 C: VA C; 2 Me: MC (E); 3 Mo: A 3-C; CP; Ai/St 45; 90; V-2 Maintains required aileron & stabilator pressure
DD.	STARTS FINAL SEGMENT OF APPROACH Visual-Pitch att: dive Bank att: level Target/pipper Flt.Inst: Alt, A/S Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Normal G	Determines airspeed building towards release conditions & rate of pipper drift	CR-7g DD 252 1 C: VA C; 2 Me: MC; 3 Mo: A 3-C; CP; Ai/20/St 40; 80; V-2 Maintains required aileron, rudder & stabilator pressure
EE.	CONTINUES ON FINAL Visual-Pitch att: dive Bank att: level Target/pipper Flt.Inst: Alt, A/S Aural-Normal aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Determines satisfactory sight picture approaching	CR-7g EE 252 1 C: VA C; 2 Me: MC; 3 Mo: A 3-C; CP; Ai/20/St 45; 90; V-2 Maintains required aileron, rudder & stabilator pressure

SITUATION Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g TASK 30° Rockets Delivery/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Rocket Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
FF.	LAUNCHES ROCKETS Visual-Pitch att: dive Bank att: level Target/pipper Flt.Inst: Alt, A/S Aural-Normal aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Determines proper sight picture for weapon release	CR 7g FF 252 1 C: VA C; 2 Me: MC; 3 Mo: A 3-C; CP; St Ds Rl 45; 90; V-2 Maintains required aileron, rudder & stabilator pressure; activates weapon release button
GG.	STARTS RECOVERY Visual-Pitch att: dive Bank att: level Target/pipper Aural-Chg. in aircraft sound, communication (following aircraft) Control-Aileron, rudder & stabilator pressure, weapon release button Motion-Normal G	Determines need to effect smooth recovery to 4G's within 2 seconds	CR 7g GG 271 1 C: VA C; 2 Me: MC; 3 Mo: R 3-C; CP; St 45; 45; V-1 Moves stabilator
HH.	BEGINS 4G PULL OUT Visual-Pitch att: increasing Bank att: level Target Leading aircraft Aural-Chg. in aircraft sound, communication - range officer (gives rocket score) Control-Increased stabilator pressure, constant aileron & rudder pressure Motion-Positive G onset	Determines satisfactory pitch movement & need to increase power to full mil. as nose comes through horizon	CR 7g HH 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; St TA 50; 100; V-2 Maintains stabilator pressure & moves throttle
II.	ESTABLISHES 4G PULL OUT Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Flt.Inst: G meter Aural-Chg. in aircraft sound Control-Constant stabilator pressure, throttle advance Motion-Constant positive G, pitching up, acceleration	Determines 4G schedule approaching & need to establish constant schedule	CR 7g II 36 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; SP; St 55; 55; V-1 Maintains stabilator pressure

SITUATION: Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g TASK 30° Rockets Delivery/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Rocket Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
JJ.	STOPS PULL OUT Visual-Pitch att: increasing Bank att: level Range landmarks Leading aircraft Aural-Chg. in aircraft sound Control-Constant stabilator pressure Motion-Constant positive G, pitching up	Determines proper pitch achieved & need for trim	CR-7g JJ 17 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; SP; St Tr 40; 80; V-2 Relaxes stabilator pressure, adjusts trim
KK.	PREPARES TRANSITION TO CLIMBING TURN Visual-Pitch att: climb Bank att: level Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Decreased stabilator pressure, trim switch function Motion-Constant positive G	Anticipates initiating climbing turn to downwind when nose passes 10-20° above horizon Sustains climb	CR-7g KK 92 1 C: VC M; 2 Me: MR (F); 3 Mo: A 3-C; SP; Ai St 35; 70; V-2 Maintains required aileron & stabilator control
LL.	STARTS ROLL IN TO CLIMBING TURN Visual-Pitch att: climb Bank att: level Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G	Determines nose passing through 10-20° & need to initiate turn to downwind	CR-7g LL 275 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai Ru St 45; 225; V-5 Coordinates aileron & rudder movement, moves stabilator
MM.	CONTINUES ROLL IN TO CLIMBING TURN Visual-Pitch att: increasing Bank att: roll Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Increased aileron rudder & stabilator pressure Motion-Increased positive G, pitching up, rolling	Determines desired pitch attitude & satisfactory roll rate/turn for proper spacing	CR-7g MM 274 1 C: VC M; 2 Me: MC; 3 Mo: R 3-C; CP; Ai Ru St 50; 200; V-4 Maintains coordinated aileron, rudder & stabilator pressure

SITUATION Aircraft established on downwind at 7000' AGL, 300-350 knots, weapons select switches set and confirmed with WSO, second aircraft in flight, first pass, new event.

TASK NO. CR-7g TASK 30° Rockets Delivery/Controlled Range AIRCRAFT F-4E

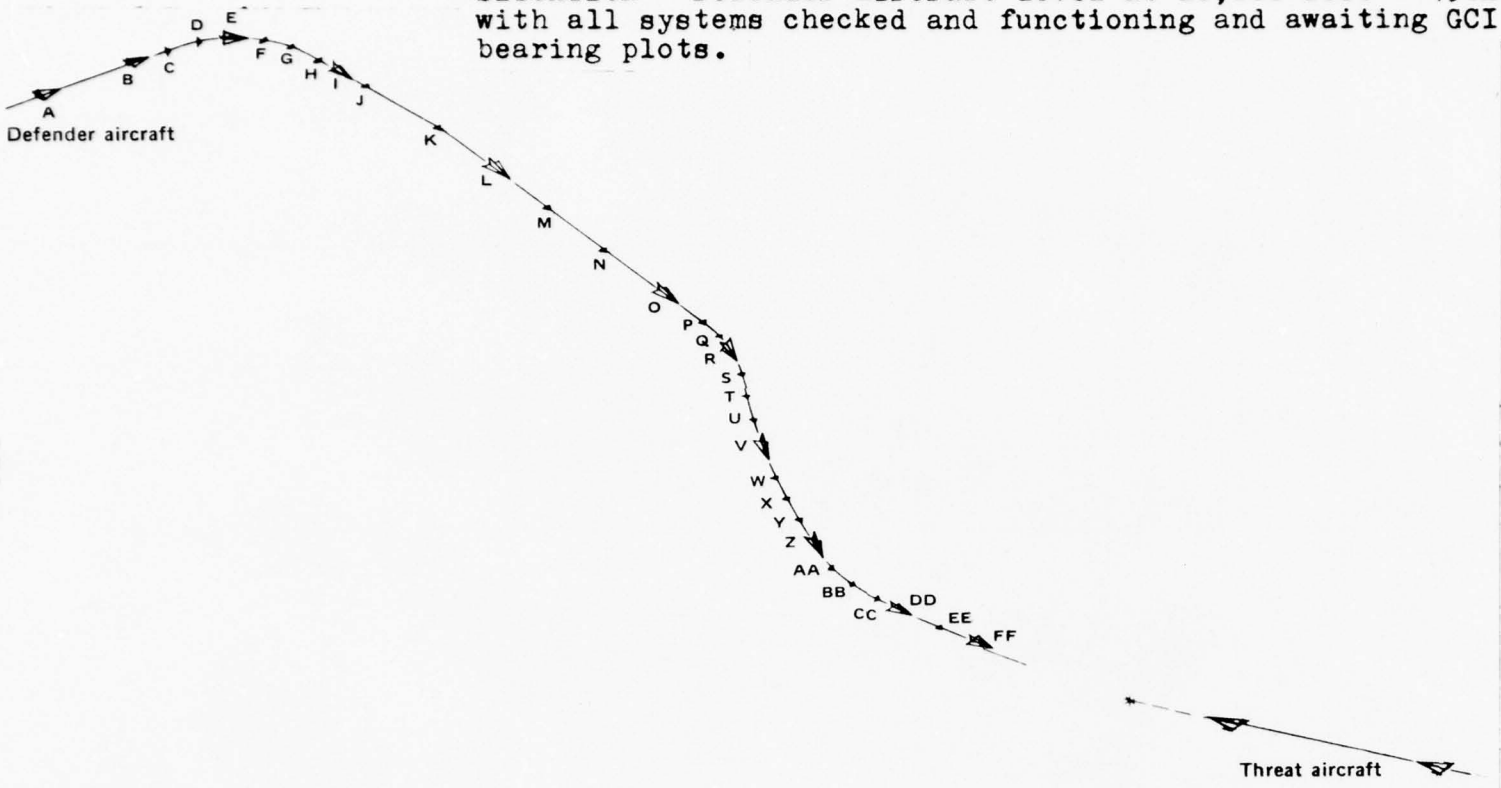
TASK GOAL Perform Rocket Delivery DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
NN.	STOPS ROLL IN TO CLIMBING TURN Visual-Pitch att: constant Bank att: roll Range landmarks Leading aircraft Aural-Normal aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Constant positive G, constant pitch, rolling	Determines proper pitch attitude & bank angle achieved	CR-7g NN 15 1 C: VC M 2 Me: MC 3 Mo: A Quantity: 3-C Decision Proc: SP Motor Output: A/C/Sc Input Index: 50 I/O Input: 250 Output Index: V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
00.	ESTABLISHES CLIMBING TURN Visual-Pitch att: constant Bank att: constant Range landmarks Leading aircraft Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, constant pitch, roll stabilized	Determines need for trim	CR-7g 00 12 1 C: VC M 2 Me: MC 3 Mo: A Quantity: 3-C Decision Proc: SP Motor Output: Tr/Sc Input Index: 50 I/O Input: 100 Output Index: V-2 Adjusts trim, maintains stabilator pressure

One v One INTERCEPT/SINGLE TURN CONVERSION

(Missile Shot, Like Aircraft, Controlled Range Exercise)

SITUATION - Defender aircraft level at 20,000 feet - 450kts. with all systems checked and functioning and awaiting GCI bearing plots.



Single turn conversion maneuver diagram.

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'. AIM-7 attack

TASK NO. CR-1a **TASK** Air to air intercept/Range Controlled **AIRCRAFT** F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	RECEIVES GCI COMMITMENT AGAINST TARGET AIRCRAFT Visual-Pitch att: level Bank att: level Flt.Inst: cross check Aural-Normal aircraft sound, communication - GCI Control-Aileron & stabilator pressure Motion-Normal G	Discerns communication (GCI advises commit on target) Sustains level flight	CR-1a A 212 1 C: VA C; 3-C 2 Me: S'C (I); SP 3 Mo: A; DS Ai Cm St; V-2 30 60 Activates mic. button, communicates - (acknowledgment), maintains required aileron & stabilator control
B.	PREPARES TURN TO ATTACK VECTOR AND CLIMB TO COMBAT ALTITUDE Visual-Pitch att: level Bank att: level Flt.Inst: cross check Aural-Normal aircraft sound, communication - WSO (calls radar contact & lock-on) Control-Aileron & stabilator pressure, mic. button function Motion-Normal G	Anticipates climbing turn Sustains level flight	CR-1a B 332 1 C: VA C; 3-C 2 Me: MR (I); CP 3 Mo: A; Ai St; V-2 35 70 Maintains aileron & stabilator control
C.	STARTS ROLL IN AND CLIMB Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound, communication - WSO (calls turn heading) Control-Aileron & stabilator pressure Motion-Normal G	Discerns requirement to start turn, climb to target vector	CR-1a C 195 1 C: VA C; 3-C 2 Me: SC; SP 3 Mo: R; Ai Rv St Th; V-5 25 125 Coordinates aileron and rudder, moves stabilator, moves throttle
D.	CONTINUES ROLL IN AND CLIMB Visual-Pitch att: increasing Bank att: rolling Aural-Chg. in aircraft sound Control-Increased aileron, stabilator & rudder pressure; throttle advance Motion-Positive G onset, acceleration, pitching up, rolling	Determines satisfactory pitch & roll rate	CR-1a D 277 1 C: VA CM; A-C 2 Me: MC; CP 3 Mo: R; Ai St Rv; V-2 55 110 Maintains aileron, rudder & stabilator pressure

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'. AIM-7 attack

TASK NO. CR-1a TASK Air to air intercept/ Controlled Range AIRCRAFT F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	STOPS ROLL IN AND CLIMB Visual-Pitch att: increasing Bank att: rolling Aural-Chg. in aircraft sound Control-Constant aileron, stabilator & rudder pressure Motion-Increasing positive G, pitching up, rolling	Determines proper pitch & bank angles approaching	CR-1a E 20 1 C: VA CM; 2 Me: MC; 3 Mo: A QUANTITY: AC; DECISION PROC: SP; MOTOR OUTPUT: A/RU/St INPUT INDEX: 45; I/O INDEX: 225; OUTPUT INDEX: V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
F.	CONTINUES TURN/CLIMB Visual-Pitch att: constant Bank att: constant Flt.Inst: cross check Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, stabilized pitch & roll	Sustains climbing turn	CR-1a F 372 1 C: VC M; 2 Me: I; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: A/St INPUT INDEX: 35; I/O INDEX: 70; OUTPUT INDEX: V-2 Maintains aileron & stabilator control
G.	STARTS ROLL OUT, CONTINUES CLIMB Visual-Pitch att: constant Bank att: rolling Tracking: radar scope Aural-Normal aircraft sound, communication - WSO (calls roll out) Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch, rolling	Discerns point for roll out	CR-1a G 440 1 C: VA CM; 2 Me: SC; 3 Mo: R QUANTITY: AC; DECISION PROC: CP; MOTOR OUTPUT: A/RU/St INPUT INDEX: 45; I/O INDEX: 225; OUTPUT INDEX: V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
H.	CONTINUES ROLL OUT Visual-Pitch att: constant Bank att: rolling Aural-Normal aircraft sound Control-Increased aileron & rudder pressure, constant stabilator pressure Motion-Decreasing positive G, constant pitch, rolling	Determines satisfactory roll rate & constant pitch attitude	CR-1a H 272 1 C: VC M; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: A/RU/St INPUT INDEX: 40; I/O INDEX: 80; OUTPUT INDEX: V-2 Maintains aileron, rudder & stabilator pressure

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'. AIM-7 attack

TASK NO. CR-1a **TASK** Air to air intercept/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	STOPS ROLL OUT, CONTINUES CLIMB Visual-Pitch att: constant Bank att: rolling Flt.Inst: cross check Aural-Normal aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Decreasing positive G, constant pitch, rolling	Determines wings level attitude approaching with constant pitch	CR-1a I 255 1 C: VC M; 3-C; 45 2 Me: MC; CP; 225 3 Mo: A; A/R/St; V-S Coordinates aileron & rudder, maintains stabilator pressure
J.	STARTS LEVEL OFF Visual-Pitch att: climb Bank att: level Flt.Inst: HSI Trk.Inst: radar scope (target heading determination) Aural-Normal aircraft sound, communication - WSO *(calls azimuth, elevation & overtake) Control-Neutral aileron & rudder, constant stabilator pressure Motion-Decreasing positive G, constant pitch	Discerns level off at combat altitude	CR-1a J 146 1 C: VA CM; 4C; 40 2 Me: SC; SP; 40 3 Mo: R; St; V-1 Moves stabilator
K.	COMPLETES LEVEL OFF Visual-Pitch att: decreasing Bank att: level Flt.Inst: cross check Aural-Normal aircraft sound, *communication - WSO Control-Decreased stabilator pressure Motion-Decreasing positive G, pitching down	Determines level at combat altitude	CR-1a K 16 1 C: VA CM; 4-C; 35 2 Me: MC; SP; 35 3 Mo: A; St; V-1 Relaxes stabilator pressure
L.	SETS COMBAT MACH Visual-Pitch att: level Bank att: level Flt.Inst: Alt, A/S Aural-Normal aircraft sound, communication - WSO **(calls target & alt.) Control-Decreased stabilator pressure Motion-Normal G, pitch stabilized	Determines combat Mach achieved	CR-1a L 16 1 C: VA CM; 4-C; 35 2 Me: MC; SP; 35 3 Mo: A; Th; V-1 Adjusts throttle (minimum AB)

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'. AIM-7 attack

TASK NO. CR-1a **TASK** Air to air intercept/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	CONTINUES INTERCEPT VECTOR Visual-Pitch att: level Bank att: level Aural-Chg. in aircraft sound, communication - GCI (calls target hostile) Control-Throttle advance Motion-Normal G, acceleration	Discerns GCI communication & need to acknowledge Sustains level flight	CR1a M 217 1 C: VA, CM; 2 Me: SC (I); 3 Mo: A 4-C; SP; A' Rs St Sq 30; 60; V-2 Activates master arm Maintains required aileron & stabilator control, activates mic. button, communicates
N.	CONTINUES INTERCEPT VECTOR Visual-Pitch att: level Bank att: level Flt.Inst: HSI Armament: Msl. status Aural-Normal aircraft sound, communication - WSO (calls "Judy" - taking over intercept) Control-Aileron & stabilator pressure, master arm function Motion-Normal G, mic. button function	Discerns satisfactory vector information Sustains level flight	CR-1a N 212 1 C: VA, CM; 2 Me: SC (I); 3 Mo: A 4-C; CP; A' St 45; 90; V-2 Maintains required aileron & stabilator control
O.	CONTINUES INTERCEPT Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound, **communication - WSO Control-Aileron & stabilator pressure Motion-Normal G	Sustains level flight	CR1a O 132 1 C: VA, C; 2 Me: I; 3 Mo: A 3-C; SP; A' St 25; 50; V-2 Maintains required aileron & stabilator control

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'. AIM-7 attack

TASK NO. CR-1a TASK Air to air intercept/ Controlled Range AIRCRAFT F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
P.	PREPARES HARD TURN TO TARGET Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound, **communication - WSO Control-Aileron & stabilator pressure Motion-Normal G	Anticipates turn to intercept vector Sustains level flight	CR-1a P 277 1 C: VA C; 2 Me: MR (I); 3 Mo: A Quantity: 3-C; Decision Proc: CP; Motor Output: Al St Input Index: 25; I/O Index: 50; Output Index: V-2 Maintains required aileron & stabilator control
Q.	STARTS TURN TO INTERCEPT VECTOR Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound Control-Aileron, stabilator & rudder pressure Motion-Normal G	Determines need to start turn to attack vector	CR-1a Q 270 1 C: VC; 2 Me: MC; 3 Mo: R Quantity: 2-C; Decision Proc: CP; Motor Output: Al Ru Th Input Index: 25; I/O Index: 125; Output Index: V-5 Coordinates (rapid) aileron & rudder with throttle movement
R.	CONTINUES ROLL IN Visual-Pitch att: level Bank att: rolling Flt.Inst: ADI Trk.Inst:radar scope Aural-Chg. in aircraft sound Control-Increased aileron & rudder pressure, throttle advance Motion-Normal G, rolling	Determines satisfactory roll rate & need for stabilator to maintain level turn	CR-1a R 280 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: Al Ru St Input Index: 45; I/O Index: 225; Output Index: V-5 Maintains coordinated aileron & rudder pressure, moves stabilator
S.	STOPS ROLL IN Visual-Pitch att:increasing Bank att: rolling Aural-Normal aircraft sound **communication - WSO Control-Increased stabilator pressure, constant aileron & rudder pressure Motion-Positive G onset, rolling, pitching up	Determines correct bank angle approaching	CR-1a S 29 1 C: VA CM; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: SP; Motor Output: Al Ru St Input Index: 45; I/O Index: 225; Output Index: V-5 Coordinates aileron & rudder pressure, relaxes stabilator pressure

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'.

TASK NO. CR-1a **TASK** AIM-7 attack Air to air intercept/ Controlled Range **AIRCRAFT** F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
T.	CONTINUES TURN Visual-Pitch att: constant Bank att: constant Flt.Inst: ADI, Alt. Aural-Normal aircraft sound Control-Neutral aileron & rudder pressure, decreased stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Sustains turn	CR-1a T 132 1 C: VC M; 2 Me: I; 3 Mo: A Quantity: 3-C; Decision Proc: SP; Motor Output: Ai/St Input Index: 40; I/O Index: 80; Output Index: V-2 Maintains required aileron & stabilator control
U.	STARTS ROLL OUT Visual-Pitch att: constant Bank att: constant Flt.Inst: ADI, HSI Aural-Normal aircraft sound, communication - WSO (calls "roll out") Control-Aileron, rudder & stabilator pressure Motion-Constant positive G, pitch & roll constant	Discerns roll out point	CR-1a U 200 1 C: VA C M; 2 Me: SC; 3 Mo: R Quantity: 4-C; Decision Proc: SP; Motor Output: Ai/Ru/St Input Index: 55; I/O Index: 275; Output Index: V-5 Coordinates aileron & rudder pressure, relaxes stabilator pressure
V.	CONTINUES ROLL OUT Visual-Pitch att: decreasing Bank att: rolling Aural-Normal aircraft sound Control-Increased aileron & rudder, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines satisfactory roll rate	CR-1a V 280 1 C: VC AM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: Ai/Ru/St Input Index: 40; I/O Index: 200; Output Index: V-5 Maintains coordinated aileron & rudder pressure, relaxes stabilator pressure
W.	STOPS ROLL OUT Visual-Pitch att: decreasing Bank att: rolling Flt.Inst: ADI, HSI Aural-Normal aircraft sound Control-Constant aileron & rudder pressure, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines point for roll out achieved	CR-1a W 20 1 C: VA C M; 2 Me: MC; 3 Mo: A Quantity: 4-C; Decision Proc: SP; Motor Output: Ai/Ru/St Input Index: 50; I/O Index: 250; Output Index: V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'. AIM -7 attack

TASK NO. CR-1a TASK Air to air intercept/ Controlled Range AIRCRAFT F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
X.	PREPARES FOR FINAL ATTACK Visual-Pitch att: level Bank att: level Trk.Inst: radar scope Aural-Normal aircraft sound, **communication - WSO Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Normal G, pitch & roll stabilized	Anticipates final attack steering Sustains level flight	CR-1a X 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: Ai St Input Index: 35; I/O Index: 70; Output Index: V-2 Maintains required aileron & stabilator control
Y.	PRESSES FINAL ATTACK STEERING Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines turn & climb required to achieve firing envelope position	CR-1a Y 270 1 C: VC; 2 Me: MC; 3 Mo: R Quantity: 2-C; Decision Proc: CP; Motor Output: Ai Ru St Input Index: 20; I/O Index: 100; Output Index: V-5 Coordinates aileron & rudder movement, moves stabilator
Z.	CONTINUES ROLL IN TO FINAL ATTACK Visual-Pitch att: increasing Bank att: rolling Trk.Inst: radar scope attack display Aural-Normal aircraft sound, communication - WSO (calls "you have the dot" - pilot now has control of intercept) Control-Increased aileron rudder & stabilator pressure Motion-Positive G onset, pitching up, rolling	Determines correctives to pitch & roll rates	CR-1a Z 277 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: Ai Ru St Input Index: 50; I/O Index: 100; Output Index: V-2 Maintains aileron & rudder pressure with constant stabilator pressure
AA.	STOPS ROLL IN Visual-Pitch att: increasing Bank att: rolling Trk.Inst: radar scope attack display Aural-Normal aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching up, rolling	Determines proper pitch & bank angle approaching	CR-1a AA 275 1 C: VC M; 2 Me: MC; 3 Mo: R Quantity: 3-C; Decision Proc: CP; Motor Output: Ai Ru St Input Index: 45; I/O Index: 225; Output Index: V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure

SITUATION Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'.

TASK NO. CR-1a TASK AIM-7 attack Air to air intercept/ Controlled Range AIRCRAFT F-4E

TASK GOAL Perform single turn conversion, launch AIM-7 DATE Sept., 1977

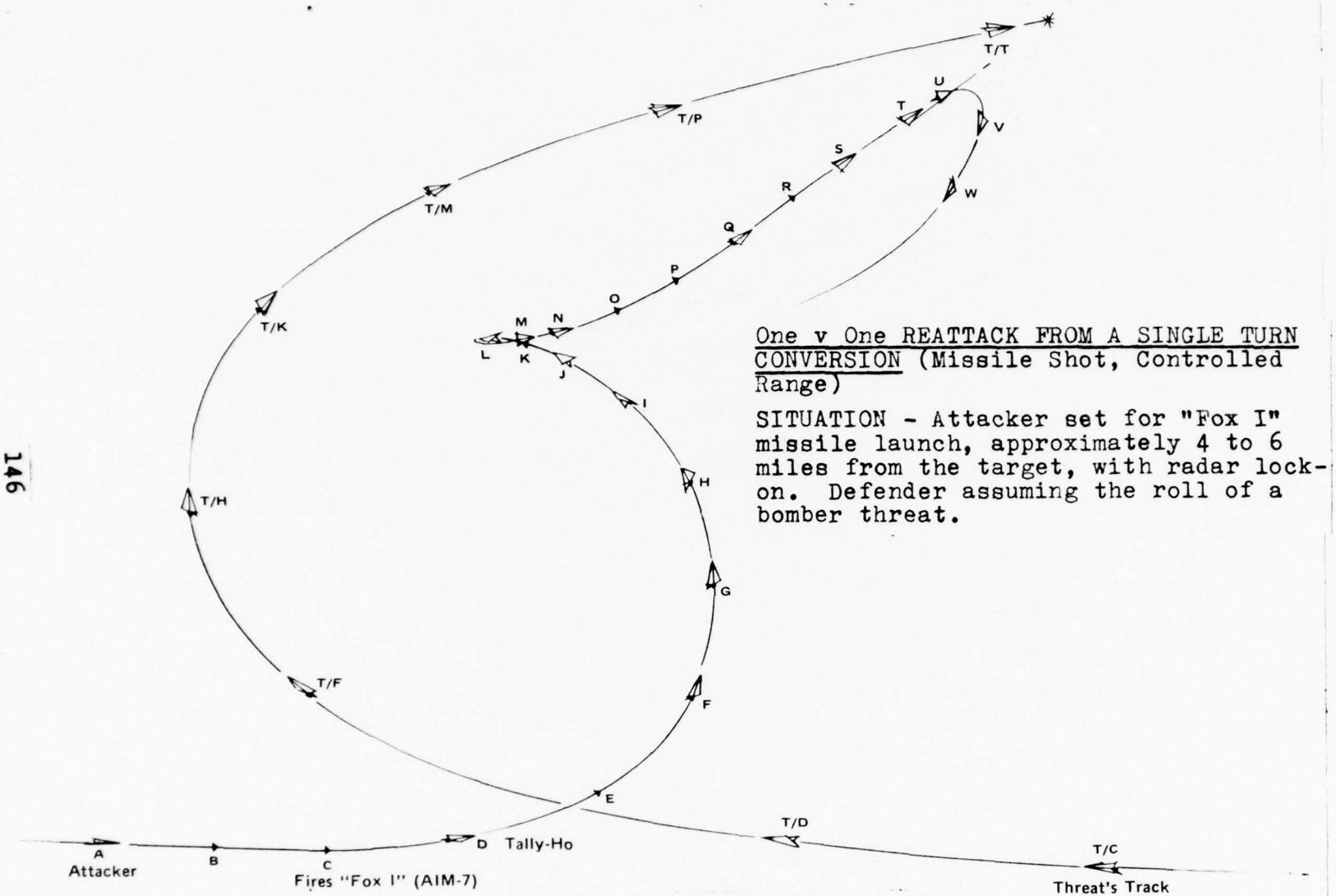
EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
BB.	CONTINUES TURN TO FINAL ATTACK VECTOR Visual-Pitch att: climb (constant) Bank att: rolling Aural-Normal aircraft sound, communication - WSO (calls target range & launch range) Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitching up, roll stabilizing	Sustains turn	CR-1a SB 157 1 C: VA, CM 2 Me: I 3 Mo: R AC / SP / Ai, Ru, St 35 / 70 / V-2 Maintains required aileron, rudder & stabilator pressure
CC.	STARTS ROLL OUT ON ATTACK VECTOR Visual-Pitch att: constant Bank att: rolling Trk.Inst: radar scope attack display Aural-Normal aircraft sound Control-Aileron, rudder & stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Determines lead point for roll out achieved	CR-1a CC 275 1 C: VC, M 2 Me: MC 3 Mo: R 3-C / CP / Ai, Ru, St 45 / 225 / V-5 Coordinates aileron & rudder pressure, maintains stabilator pressure
DD.	CONTINUES ROLL OUT Visual-Pitch att: constant Bank att: rolling Trk.Inst: radar scope attack display Aural-Normal aircraft sound, communication - WSO (calls target range & launch range) Control-Increased aileron & rudder pressure, constant stabilator pressure Motion-Decreasing positive G, pitch constant, rolling	Determines need for minor corrections in pitch attitude & roll rate to center steering dot	CR-1a DD 277 1 C: VA, CM 2 Me: MC 3 Mo: R 4-C / CP / Ai, St 50 / 100 / V-2 Moves aileron & relaxes stabilator pressure

SITUATION: Defender aircraft, level at 20,000', 450 knots, all systems checked and functioning, awaiting GCI bearing plots; hostile aircraft at 27,000'.

TASK NO. CR-1a TASK: Air to air intercept/ AIM-7 attack Controlled Range AIRCRAFT: F-4E

TASK GOAL: Perform single turn conversion, launch AIM-7 DATE: Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
EE.	STOPS ROLL OUT Visual-Pitch att: decreasing Bank att: rolling Trk.Inst: radar scope attack display Aural-Chg. in aircraft sound Control-Increased aileron, decreased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines steering dot centered	CR-1a EE 37 1 C: KIND VA CM; QUANTITY 4-C; INPUT INDEX 45 2 Me: INFO PROCESS MC; DECISION PROC SP; I/O INPUT 90 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai Ru St; OUTPUT INDEX V-2 Maintains aileron, stabilator & rudder pressure
FF.	FIRES AIM-7 MISSILE Visual-Pitch att: climb Bank att: level Trk.Inst: radar scope attack display Aural-Chg. in aircraft sound, communication - WSO (calls in range) Control-Constant aileron, stabilator & rudder pressure Motion-Normal G, pitch & roll constant	Determines in heart of launch envelope & time to fire AIM-7 (dot in ASE circle while expanding) Sustains climb	CR-1a FF 317 1 C: KIND VA CM; QUANTITY 4-C; INPUT INDEX 50 2 Me: INFO PROCESS MC (I); DECISION PROC CP; I/O INPUT 100 3 Mo: CONTINUITY R; MOTOR OUTPUT Ai St Ds; OUTPUT INDEX V-2 Maintains required aileron & stabilator control, activates missile firing trigger (twice)



Reattack maneuver diagram.

One v One REATTACK FROM A SINGLE TURN CONVERSION (Missile Shot, Controlled Range)

SITUATION - Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming the roll of a bomber threat.

SITUATION Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming roll of a bomber threat.

TASK NO. CR-2a TASK Reattack/Controlled Range AIRCRAFT F-4E

TASK GOAL To Reattack from Single Turn Conversion and launch AIM-9 DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	APPROACHES "FOX I" MISSILE SHOT (FRONT QUARTERING ATTACK) Visual-Pitch att: level Bank att: constant Trk.Inst: radar scope attack display Aural-Normal aircraft sound, communication - WSO *(calls azimuth, elevation, range & knots overtake in relation to hostile aircraft) Control-Constant aileron, rudder & stabilator pressure Motion-Normal G	Determines "Fox I" parameters approaching (steering dot centering) Sustains climb	CR-2a A 295 1 C: VA C; 2 Me: MC (I); 3 Mo: A 3-C; CP; Ai Ru St 35; 70; V-2 Maintains required aileron, rudder & stabilator control
B.	PREPARES FOR "FOX I" LAUNCH & REATTACK Visual-Pitch att: level Bank att: constant Trk.Inst: radar scope attack display Aural-Normal aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Anticipates missile launch & reattack Sustains climb	CR-2a B 332 1 C: VA C; 2 Me: MR (I); 3 Mo: A 3-C; CP; Ai Ru St 35; 70; V-2 Maintains required aileron, rudder & stabilator control
C.	LAUNCHES "FOX I" (AIM-7) Visual-Pitch att: level Bank att: constant Trk.Inst: radar scope attack display Aural-Normal aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Normal G	Determines proper missile launch parameters, need to launch missile & communicate (call "Fox I" to GCI) Sustains climb	CR-2a C 292 1 C: VA C; 2 Me: MC (I); 3 Mo: A 3-C; CP; Ai Ds Ru Cm St Os 35; 70; V-2 Activates trigger; maintains required aileron, rudder & stabilator control; activates mic. button; communicates

SITUATION: Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming roll of a bomber threat.

TASK NO. CR-2a TASK: Reattack/Controlled Range To Reattack from Single Turn Conversion and launch AIM-9 AIRCRAFT: F-4E

TASK GOAL: DATE: Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
D.	STARTS PULL-UP OUT OF HOSTILE AIRCRAFT'S PLANE Visual-Pitch att: level Bank att: constant Aural-Normal aircraft sound, communication - WSO (calls "come hard up, left") Control-Aileron, rudder & stabilator pressure; trigger function; mic. function Motion-Normal G	Discerns need to pull & add power, and locate target visually	CR-2a D 195 1 C: VA; 2 Me: SC; 3 Mo: R 3-C; SP; Ai Rd St Th 40; 200; V-5 Coordinates aileron & rudder pressure, moves stabilator, moves throttle (to AB)
E.	CONTINUES PULL UP INTO LEFT TURN Visual-Pitch att: increasing Bank att: rolling Target (aircraft) Aural-Chg. in aircraft sound Control-Increased aileron & rudder pressure, increasing stabilator pressure, throttle advance Motion-Positive G onset, pitching up, rolling	Discerns target & need to continue pull-up out of hostile aircraft's plane & call "Tally Ho"	CR-2a E 440 1 C: VA CM; 2 Me: SC; 3 Mo: R 4-C; CP; Ai Rd St Cm 55; 275; V-5 Maintains coordinated aileron & rudder pressure, moves stabilator, communicates (calls "Tally Ho" to WSO)
F.	CONTINUES PULL-UP AND LEFT TURN Visual-Pitch att: increasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication - WSO (calls "Stab Out") Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Increasing positive G, pitching up, rolling	Determines need to continue pull & roll to stay behind target aircraft's 3-9 line & make aero call to WSO (target's position)	CR-2a E 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Rd St Cm 55; 110; V-2 Maintains constant aileron, rudder & stabilator pressure; communicates (pilot calls target's position in relation to wings of aircraft)

SITUATION: Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming roll of a bomber threat.

TASK NO. CR-2a TASK: Reattack/Controlled Range AIRCRAFT: F-4E

TASK GOAL: To Reattack from Single Turn Conversion and launch AIM-9 DATE: Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
G.	CONTINUES PULL-UP & ROLL OVER THE TOP Visual-Pitch att: increasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication - pilot to WSO Control-Constant aileron, rudder & stabilator pressure Motion-Constant G, pitching up, rolling	Determines need to roll over the top toward target aircraft's flight path & make aero call to WSO	CR-2a G 221 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: A-C; Decision Proc: CP; Motor Output: AI SC Cm RU Input Index: 55; I/O Index: 110; Output Index: V-2 Maintains constant aileron, rudder & stabilator pressure; communicates - WSO
H.	STARTS ROLL OVER THE TOP Visual-Pitch att: increasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication Control-Constant aileron, rudder & stabilator pressure Motion-Constant G, pitching up, rolling	Determines adequate vertical & lateral separation, need to roll over the top to target aircraft's flight path & make aero call to WSO	CR-2a H 280 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: A-C; Decision Proc: CP; Motor Output: AI RU/St Cm Input Index: 55; I/O Index: 275; Output Index: V-5 Coordinates aileron & rudder, relaxes stabilator pressure, communicates - WSO
I.	CONTINUES ROLL OVER THE TOP Visual-Pitch att: decreasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication Control-Increased aileron & rudder pressure, reduced stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines adequate vertical & lateral separation, & need to continue roll rate	CR-2a I 274 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: A-C; Decision Proc: CP; Motor Output: AI RU St Input Index: 55; I/O Index: 220; Output Index: V-4 Maintains coordinated aileron, rudder & stabilator pressure
J.	CONTINUES ROLL OVER THE TOP (INVERTED) TOWARDS TARGET'S FLIGHT PATH Visual-Pitch att: decreasing Bank att: rolling Target Aural-Chg. in aircraft sound Control-Aileron, rudder & stabilator pressure Motion-Constant positive G, pitching down, rolling	Determines proper flight path position in relation to target aircraft, need to continue roll down into target's plane, & need to make aero call to WSO	CR-2a J 280 1 C: VA CM; 2 Me: MC; 3 Mo: R Quantity: AC; Decision Proc: CP; Motor Output: AI RU/St Cm Input Index: 50; I/O Index: 250; Output Index: V-5 Maintains coordinated aileron & rudder pressure, moves stabilator, communicates - WSO

SITUATION Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming roll of a bomber threat.

TASK NO. CR-2a **TASK** Reattack/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To Reattack from Single Turn Conversion and launch AIM-9 **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
K.	CONTINUES ROLL & PULL TO TARGET AIRCRAFT'S FLIGHT PATH Visual-Pitch att: decreasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication Control-Aileron & rudder pressure, increased stabilator pressure Motion-Increased positive G, pitching down, rolling	Determines proper roll rate & need to continue pull down to target aircraft's plane	CR-2a K 279 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; AI RU St 55; 220; V-4 Maintains coordinated aileron, rudder & stabilator pressure
L.	ADJUSTS ROLL AND PULL TO GET INSIDE TARGET'S FLIGHT PATH, SLIGHTLY LOW Visual-Pitch att: decreasing Bank att: rolling Target Aural-Chg. in aircraft sound Control-Aileron, rudder & stabilator pressure Motion-Constant positive G, pitching down, rolling	Determines roll out point approaching, need to adjust roll rate & make aero call to WSO	CR-2a L 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; AI RU St Cm 50; 250; V-5 Coordinates aileron & rudder, maintains required stabilator pressure, communicates-WSO
M.	STARTS ROLL OUT Visual-Pitch att: decreasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication Control-Increasing aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitching down, rolling	Determines roll out point approaching & need to begin roll out	CR-2a M 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; AI RU St 55; 275; V-5 Coordinates aileron & rudder, moves stabilator
N.	CONTINUES ROLL OUT Visual-Pitch att: increasing Bank att: rolling Target Aural-Chg. in aircraft sound Control-Increasing aileron rudder & stabilator pressure Motion-Positive G onset, pitching up, rolling	Determines proper roll out rate, need to continue roll out & give aero call to WSO	CR-2a N 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; AI RU St Cm 50; 250; V-5 Maintains coordinated aileron, rudder & stabilator pressure; communicates - WSO

SITUATION Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming roll of a bomber threat.

TASK NO. CR-2a **TASK** Reattack/Controlled Range **AIRCRAFT** F-4E

TASK GOAL To Reattack from Single Turn Conversion and launch AIM-9 **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
O.	STOPS ROLL OUT Visual-Pitch att: increasing Bank att: rolling Target Aural-Chg. in aircraft sound, communication Control-Constant aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching up, rolling	Determines roll out complete, need to stop roll out & give aero call to WSO	CR-2a O 40 1 C: VA, CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: SP; Motion Output: Ai, St, Rud, Cm Input Index: 55; I/O Index: 275; Output Index: V-5 Coordinates aileron & rudder, relaxes stabilator, communicates - WSO
P.	ESTABLISHED BEHIND TARGET & PARAMETERS Visual-Pitch att: decreasing Bank att: rolling Target Sight Aural-Chg. in aircraft sound, communication Control-Increased aileron & rudder pressure, reduced stabilator pressure Motion-Decreasing positive G, pitching down, rolling	BELOW FLIGHT PATH OUTSIDE "FOX II" Determines need to cage radar (5 mi. & boresight) & activate Auto. Acq. mode Sustains pursuit curve	CR-2a P 247 1 C: VA, CM; 2 Me: MC (I); 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motion Output: Ai, St, Rud, DS Input Index: 60; I/O Index: 120; Output Index: V-2 Maintains required aileron, rudder & stabilator control; activates radar cage button & Auto. Acq. button
Q.	PREPARES FOR MISSILE SHOT Visual-Pitch att: constant Bank att: constant Target Sight/pipper Aural-Chg. in aircraft sound, communication - WSO (calls "Lock On") Control-Aileron, rudder & stabilator pressure; radar cage switch function; Auto Acq. function Motion-Constant positive G, pitch & roll stabilized	Anticipates missile parameters approaching & missile launch sequence Sustains turn	CR-2a Q 337 1 C: VA, CM; 2 Me: MR (I); 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motion Output: Ai, Rud, St Input Index: 70; I/O Index: 140; Output Index: V-2 Maintains required aileron, rudder & stabilator control

SITUATION Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming roll of a bomber threat.

TASK NO. CR-2a TASK Reattack/Controlled Range AIRCRAFT F-4E

TASK GOAL To Reattack from Single Turn Conversion and launch AIM-9 DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
R.	STARTS MISSILE LAUNCH SEQUENCE Visual-Pitch att: constant Bank att: constant Target Sight/pipper Aural-Chg. in aircraft sound, communication - WSO (calls range & overtake) Control-Aileron, rudder & stabilator pressure Motion-Constant positive G	Determines slant range decreasing & need to set pinkie switch to heat function Sustains turn	CR-2a R 297 1 C: VA CM; 2 Me: MC (I); 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: AI St RU DS INPUT INDEX: 50; I/O INDEX: 100; OUTPUT INDEX: V-2 Maintains required aileron, rudder & stabilator control; activates pinkie switch (heat function)
S.	CONTINUES MISSILE LAUNCH SEQUENCE Visual-Pitch att: constant Bank att: constant Target Sight/pipper Aural-Chg. in aircraft sound, communication - WSO (calls range & overtake, weapons tone - growl) Control-Aileron, rudder & stabilator pressure; pinkie switch function Motion-Constant positive G	Determines missile parameters approaching & launch imminent Sustains turn	CR-2a S 297 1 C: VA CM; 2 Me: MC (I); 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: AI RU ST INPUT INDEX: 60; I/O INDEX: 120; OUTPUT INDEX: V-2 Maintains required aileron, rudder & stabilator control
T.	FIRES AIM-9 (FOX II) MISSILE Visual-Pitch att: constant Bank att: constant Target Sight/pipper Aural-Chg. in aircraft sound, communication - WSO (calls "In Range", weapon tone) Control-Aileron, rudder & stabilator pressure Motion-Constant positive G	Determines proper missile parameters achieved & need to launch missile separate from target aircraft Sustains turn	CR-2a T 297 1 C: VA CM; 2 Me: MC (I); 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: AI St RU DS INPUT INDEX: 55; I/O INDEX: 110; OUTPUT INDEX: V-2 Maintains required aileron, rudder & stabilator control; activates trigger

SITUATION: Attacker set for "Fox I" missile launch, approximately 4 to 6 miles from the target, with radar lock-on. Defender assuming roll of a bomber threat.

TASK NO. CR-2a TASK: Reattack/Controlled Range AIRCRAFT: F-4E

TASK GOAL: To Reattack from Single Turn Conversion and launch AIM-9 DATE: Sept., 1977

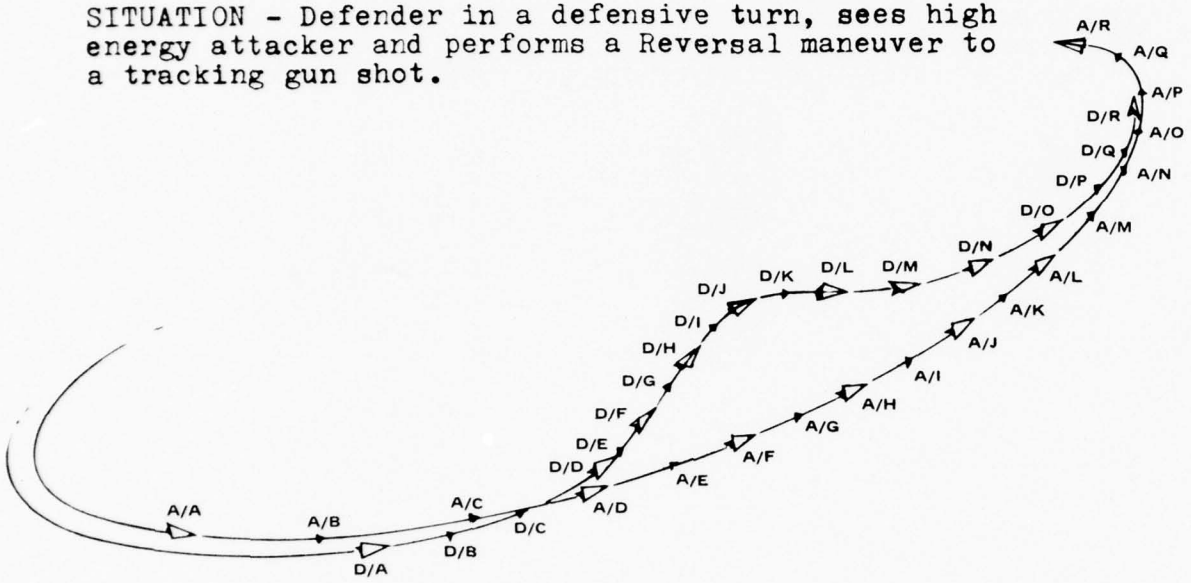
EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
U.	STARTS ROLL AWAY FROM TARGET & BEGINS SEPARATION Visual-Pitch att: constant Bank att: constant Target Aural-Chg. in aircraft sound, weapon tone (stopped) Control-Aileron, rudder & stabilator pressure; trigger function Motion-Constant positive G	Determines need to roll away from target (unload & separate from the attack)	CR-2a U 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai RU / St 50; 250; V-5 Coordinates aileron & rudder, moves stabilator
V.	CONTINUES SEPARATION Visual-Pitch att: decreasing Bank att: rolling Aural-Chg. in aircraft sound Control-Increased aileron, rudder & stabilator pressure Motion-Negative G onset, pitching down, rolling	Determines satisfactory pitch & roll attitude, & need to call "Fox II" to GCI	CR-2a V 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai St RU Lt Cm 45; 90; V-2 Maintains aileron & rudder pressure, decreased stabilator pressure, activates mic. button, communicates - GCI
W.	STOPS SEPARATION Visual-Pitch att: decreasing Bank att: rolling Aural-Chg. in aircraft sound Control-Aileron, rudder & stabilator pressure; mic. switch function Motion-Constant negative G, pitching down, rolling	Determines separation complete, need to return to straight & level cruise, need for trim	CR-2a W 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4C; CP; Ai RU / St Tm Th 50; 250; V-5 Coordinates aileron & rudder, relaxes stabilator pressure, moves throttle (out of AB), adjusts trim

One v One REVERSAL

(Tracking Gun Shot, Like Aircraft, Controlled Range)

SITUATION - Attacker fails to Yo-Yo and overshoots due to excess energy.

SITUATION - Defender in a defensive turn, sees high energy attacker and performs a Reversal maneuver to a tracking gun shot.



Reversal and counter reversal maneuver diagram.

SITUATION Defender in a defensive turn, sees high energy attacker and performs a Reversal maneuver to a tracking gun shot.

TASK NO. CR-3a **TASK** Reversal/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Defender to become the attacker **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED LEVEL DEFENSIVE TURN/ATTACKER IN SIGHT Visual-Pitch att: constant Bank att: constant Threat (aircraft) Aural-Normal aircraft sound, communication - WSO *(calls threat's position) Control-Aileron & stabilator pressure Motion-Constant positive G	Determines attacker's range & recognizes overtake Sustains defensive turn	CR30 A 297 1 C: VA CM; 2 Me: MC (I); 3 Mo: A 4-C; CP; Ai Cr St 35; 70; V-2 Checks six, maintains required aileron & stabilator control
B.	CONTINUES TURN Visual-Pitch att: constant Bank att: constant Threat Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G	Determines overshoot developing & need to increase turn rate of force overshoot	CR30 B 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Cr St 35; 175; V-5 Checks six, coordinates aileron & rudder pressure, moves stabilator
C.	CONTINUES TURN Visual-Pitch att: increasing Bank att: constant Threat Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Increasing positive G	Determines overshoot continuing & need to increase turn rate & reduce power	CR30 C 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Cr St Th 45; 225; V-5 Checks six, coordinates aileron & rudder pressure, moves stabilator, reduces throttle
D.	CONTINUES TURN AS OVERSHOOT DEVELOPS/ATTACKER SLIDES THRU 6 O'CLOCK POSITION Visual-Pitch att: increasing Bank att: rolling Threat Aural-Chg. in aircraft sound *communication - WSO Control-Aileron, rudder & stabilator pressure; throttle function Motion-Increasing positive G, deceleration	Determines attacker definitely overshooting Sustains turn	CR30 D 297 1 C: VA CM; 2 Me: MC (I); 3 Mo: A 4-C; CP; SK Ai St 55; 110; V-2 Checks six, maintains required aileron & stabilator control

SITUATION Defender in a defensive turn, sees high energy attacker and performs a Reversal maneuver to a tracking gun shot.

TASK NO. CR-3a TASK Reversal/Controlled Range AIRCRAFT F-4E

TASK GOAL Defender to become the attacker DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	PREPARES FOR REVERSAL Visual-Pitch att: constant Bank att: constant Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Constant max. G	Anticipates need to start reversal Sustains turn	CR-3a E 337 1 C: VA CM; 4C; 30 2 Me: MR (I); CP; 60 3 Mo: A; Ai St; V-2 Maintains required aileron & stabilator control
F.	STARTS REVERSAL Visual-Pitch att: constant Bank att: constant Aural-Chg. in aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, buffeting	Determines proper time & position to start reversal & need for power (based on defender's last position & rate of overshoot)	CR-3a F 280 1 C: VA CM; 4C; 35 2 Me: MC; CP; 175 3 Mo: R; Ai St; Ri Th; V-5 Moves stabilator, coordinates (top) rudder & aileron pressure, moves throttle (to AB)
G.	CONTINUES REVERSAL Visual-Pitch att: increasing Bank att: rolling Threat(back into view) Aural-Chg. in aircraft sound Control-Increasing aileron, rudder & stabilator pressure, throttle advance Motion-Increasing positive G, pitching up, rolling, buffeting, acceleration	Determines proper nose high attitude & roll rate based on relative positions	CR-3a G 277 1 C: VA CM; 4C; 65 2 Me: MC; CP; 130 3 Mo: R; Ai Ru St; V-2 Maintains top aileron, rudder & stabilator pressure
H.	CONTINUES REVERSAL Visual-Pitch att: increasing Bank att: rolling Threat Aural-Chg. in aircraft sound, AOA tone Control-Aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching up, rolling, buffeting	Determines proper nose high attitude & roll rate achieved	CR-3a H 37 1 C: VA CM; 4C; 60 2 Me: MC; SP; 120 3 Mo: R; Ai Le St; V-2 Maintains aileron & rudder pressure, relaxes stabilator pressure

SITUATION Defender in a defensive turn, sees high energy attacker and performs a Reversal maneuver to a tracking gun shot.

TASK NO. CR-3a **TASK** Reversal/Controlled Range **AIRCRAFT** F-4E

TASK GOAL Defender to become the attacker **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	STOPS NOSE HIGH SEQUENCE OF REVERSAL Visual-Pitch att: increasing Bank att: rolling Threat Aural-Chg. in aircraft sound Control-Aileron & rudder pressure, reduced stabilator pressure Motion-Decreasing positive G, pitching up, rolling	Determines proper position to continue reversal over the top (above & behind 3-9 line of attacking aircraft)	CR-3a I 257 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; CP; Ai Ri St 50; 100; V-2 Maintains aileron, rudder & stabilator pressure
J.	STARTS ROLL OVER THE TOP Visual-Pitch att: constant Bank att: constant Threat Aural-Chg. in aircraft sound Control-Constant aileron, rudder & stabilator pressure Motion-Decreasing positive G, rolling, buffeting	Determines need to continue roll over the top & pull down into attacker's 6 o'clock position	CR-3a J 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Ri St 50; 250; V-5 Increases stabilator pressure, coordinates aileron & rudder pressure
K.	CONTINUES ROLL OVER THE TOP Visual-Pitch att: decreasing Bank att: rolling Threat Aural-Chg. in aircraft sound Control-Increasing aileron & rudder pressure, increased stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines proper roll rate & rate of nose movement	CR-3a K 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Ri St 50; 100; V-2 Maintains aileron, rudder & stabilator pressure
L.	CONTINUES ROLL OVER THE TOP/CLOSING TO 6 O'CLOCK POSITION Visual-Pitch att: decreasing Bank att: rolling Threat Aural-Chg. in aircraft sound Control-Aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching down, rolling acceleration	Determines closure rate & need to pull to inside of attacker's turn	CR-3a L 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Ri St 55; 110; V-2 Maintains aileron and rudder, moves stabilator

SITUATION Defender in a defensive turn, sees high energy attacker and performs a Reversal maneuver to a tracking gun shot.

TASK NO. CR-3a TASK Reversal/Controlled Range AIRCRAFT F-4E

TASK GOAL Defender to become the attacker DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	STOPS ROLL OVER THE TOP/ROLLS OUT INSIDE ATTACKER'S FLIGHT PATH AT 3000 FEET OUT Visual-Pitch att: increasing Bank att: rolling Threat (now becomes the target) Aural-Chg. in aircraft sound Control-Constant aileron & rudder, increased stabilator pressure Motion-Increasing positive G, pitching up, rolling, acceleration	Determines proper position achieved & need to continue for gun attack	CR-3a M 277 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: AC; DECISION PROC: CP; MOTOR OUTPUT: A, E, St INPUT INDEX: 55; I/O INPUT: 110; OUTPUT INDEX: V-2 Maintains aileron & rudder, increased stabilator pressure
N.	ESTABLISHES TURN FOR GUN ATTACK Visual-Pitch att: increasing Bank att: stabilized Target/sight Aural-Chg. in aircraft sound Control-Constant aileron & rudder, increased stabilator pressure Motion-Increasing positive G, pitching up, roll stabilized	Determines need to acquire Auto Acq. lock-on and point aircraft at target	CR-3a N 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: AC; DECISION PROC: CP; MOTOR OUTPUT: A, E, St INPUT INDEX: 50; I/O INDEX: 100; OUTPUT INDEX: V-2 Maintains variable aileron, rudder and stabilator pressure
O.	STARTS TURNING ATTACK Visual-Pitch att: stabilized Bank att: constant Target/pipper Aural-Normal aircraft sound Control-Aileron, rudder & stabilator pressure Motion-Constant positive G, constant pitch, roll stabilized	Determines need to activate Auto Acq. button Sustains turning attack	CR-3a O 292 1 C: VC, M; 2 Me: MC (I); 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: A, St, RUDs INPUT INDEX: 45; I/O INDEX: 90; OUTPUT INDEX: V-2 Maintains variable required aileron, rudder & stabilator pressure; activates Auto Acq. button
P.	CONTINUES TURNING ATTACK & ACQUIRES LOCK-ON Visual-Pitch att: constant °(variable) Bank att: constant °(variable) Target/pipper Sight analog bar Aural-Normal aircraft sound, communication Control-Aileron, rudder & stabilator pressure Auto Acq. button Motion-°Constant positive G °Constant pitch & roll	Determines radar lock-on & need to begin tracking solution	CR-3a P 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: AC; DECISION PROC: CP; MOTOR OUTPUT: A, E, St INPUT INDEX: 60; I/O INDEX: 120; OUTPUT INDEX: V-2 Maintains variable required aileron, rudder & stabilator pressure

SITUATION Defender in a defensive turn, sees high energy attacker and performs a Reversal maneuver to a tracking gun shot.

TASK NO. CR-3a TASK Reversal/Controlled Range AIRCRAFT F-4E

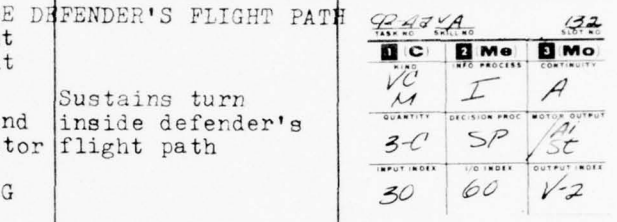
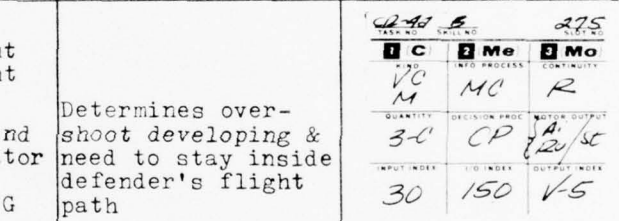
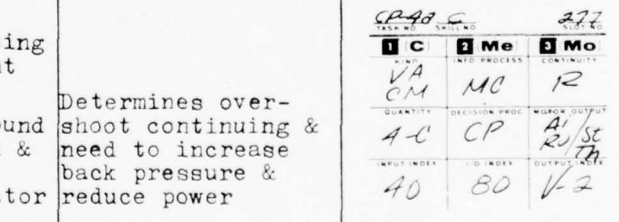
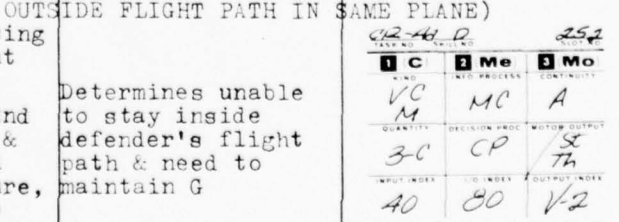
TASK GOAL Defender to become the attacker DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Q.	PRESSES ATTACK AND FIRES Visual-Pitch att: °Constant Bank att: °Constant Target/pipper Sight analog bar Aural-Normal aircraft sound Control-°Constant aileron, rudder & stabilator pressure Motion-°Constant positive G, °constant pitch & roll	Determines proper position to fire based on range & sight picture	CR 3a Q 252 1 C: VC M; 2 Me: MC; 3 Mo: A 3-C; CP; A1 2 DS 50; 100; V-2 Maintains required variable aileron, rudder & stabilator pressure; activates trigger
R.	CONTINUES TRACKING AND CEASES FIRE Visual-Pitch att: °Constant Bank att: °Constant Target/pipper Sight analog bar Aural-Normal aircraft sound, weapons sound Control-°Constant aileron, rudder & stabilator pressure; trigger function Motion-°Constant positive G, °Constant pitch & roll	Discerns target jinking	CR 3a R 177 1 C: VA C M; 2 Me: SC; 3 Mo: A 4-C; SP; A1 2 DS 60; 120; V-2 Maintains required variable aileron, rudder & stabilator control; deactivates trigger

SITUATION Attacker fails to Yo-Yo and overshoots due to excess energy.

TASK NO. CR-4a TASK Reversal/Controlled Range AIRCRAFT F-4E

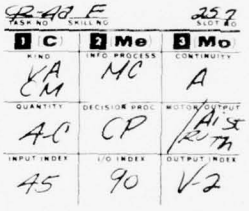
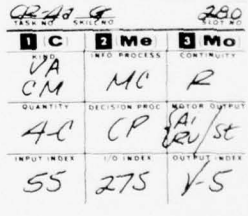
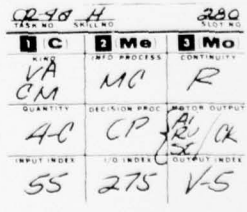
TASK GOAL Attacker to become defender DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHED IN TURN INSIDE DEFENDER'S FLIGHT PATH Visual-Pitch att: constant Bank att: constant Target Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G	Sustains turn inside defender's flight path	 Maintains required aileron & stabilator pressure
B.	CONTINUES TURN Visual-Pitch att: constant Bank att: constant Target Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G	Determines overshoot developing & need to stay inside defender's flight path	 Coordinates aileron & rudder pressure, increases stabilator pressure
C.	TIGHTENS TURN Visual-Pitch att: increasing Bank att: constant Target Aural-Chg. in aircraft sound Control-Increased aileron & rudder pressure, increased stabilator pressure Motion-Increasing positive G	Determines overshoot continuing & need to increase back pressure & reduce power	 Maintains aileron & rudder pressure, moves stabilator, moves throttle (out of AB)
D.	BEGINS OVERSHOOT (SLIDES OUTSIDE FLIGHT PATH IN SAME PLANE) Visual-Pitch att: increasing Bank att: constant Target Aural-Normal aircraft sound Control-Constant aileron & rudder, increased stabilator pressure, throttle decrease Motion-Increasing positive G	Determines unable to stay inside defender's flight path & need to maintain G	 Maintains stabilator pressure, reduces throttle

SITUATION Attacker fails to Yo-Yo and overshoots due to excess energy.

TASK NO. CR-4a TASK Reversal/Controlled Range AIRCRAFT F-4E

TASK GOAL Attacker to become defender DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES OVERSHOOT Visual-Pitch att: constant Bank att: constant Target (sees target moving behind) Aural-Chg. in aircraft sound Control-Constant aileron, rudder & stabilator pressure, throttle reduction Motion-Decreasing positive G, deceleration	Determines definite overshoot developing Sustains level turn	 Maintains required aileron & stabilator control
F.	CONTINUES LEVEL TURN Visual-Pitch att: constant Bank att: constant Target Aural-Normal aircraft sound, communication - WSO *(calls out target's position) Control-Aileron & stabilator pressure Motion-Decreasing positive G, pitching down, deceleration	Determines defender starting reversal & need for power	 Maintains aileron, rudder & stabilator pressure; throttle advance (to AB)
G.	STARTS DESCENDING TURN Visual-Pitch att: constant Bank att: constant Target Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure; throttle function Motion-Constant positive G, acceleration	Determines reversal continuing, need to lower nose & increase airspeed	 Coordinates aileron & rudder pressure, increases stabilator pressure
H.	CONTINUES DESCENDING TURN Visual-Pitch att: descending Bank att: rolling Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron & rudder pressure, increased stabilator pressure Motion-Decreasing positive G, pitching down, rolling acceleration	Determines defender continuing nose high reversal, need to continue descending turn	 Checks six, maintains coordinated aileron, rudder & stabilator pressure

SITUATION Attacker fails to Yo-Yo and overshoots due to excess energy.

TASK NO. CR-4a TASK Reversal/Controlled Range AIRCRAFT F-4E

TASK GOAL Attacker to become defender DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	CONTINUES DESCENDING TURN Visual-Pitch att: descending Bank att: rolling Target Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Constant positive G, pitching down, rolling	Sustains descending turn	CR-4a I 157 1 C: VA, CM; 2 Me: I; 3 Mo: R QUANTITY: 4C; DECISION PROC: SP; MOTOR OUTPUT: Ai, St INPUT INDEX: 55; I/O INDEX: 110; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
J.	CONTINUES DESCENDING TURN Visual-Pitch att: descending Bank att: rolling Target Aural-Chg. in aircraft sound *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, pitching down, rolling	Determines need to keep descending turn going Sustains descending turn	CR-4a J 297 1 C: VA, CM; 2 Me: MC (I); 3 Mo: A QUANTITY: 4C; DECISION PROC: CP; MOTOR OUTPUT: Ai, St INPUT INDEX: 50; I/O INDEX: 100; OUTPUT INDEX: V-2 Checks six, maintains required aileron, rudder & stabilator control
K.	INCREASES TURN INTO DEFENDER Visual-Pitch att: constant Bank att: constant Target Aural-Normal aircraft sound, *communication - WSO Control-Constant aileron, rudder & stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Discerns defender rolling over the top (probable gun attack & need to increase turn into defender)	CR-4a K 1 C: VA, CM; 2 Me: SC; 3 Mo: R QUANTITY: 4C; DECISION PROC: CP; MOTOR OUTPUT: Ai, Rr, St INPUT INDEX: 50; I/O INDEX: 250; OUTPUT INDEX: V-5 Coordinates aileron & rudder pressure, moves stabilator
L.	CONTINUES HARD TURN INTO DEFENDER Visual-Pitch att: descending Bank att: rolling Target Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching down, rolling	Determines defender closing at 6 o'clock & need to continue turn	CR-4a L 251 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: 4C; DECISION PROC: CP; MOTOR OUTPUT: Ai, St INPUT INDEX: 45; I/O INDEX: 90; OUTPUT INDEX: V-2 Checks six, maintains stabilator pressure

SITUATION Attacker fails to Yo-Yo and overshoots due to excess energy.

TASK NO. CR-4a TASK Reversal/Controlled Range AIRCRAFT F-4E

TASK GOAL Attacker to become defender DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
M.	CONTINUES HARD TURN INTO DEFENDER Visual-Pitch att: constant Bank att: constant Target Aural-Chg. in aircraft sound *communication - WSO Control-Constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Determines defender still out of gun range & need to continue turn	CR-4a M 257 1 C: VA CM; 2 Me: MC; 3 Mo: A A-C; CP; Ck St 45; 90; V-2 Checks six, increases stabilator pressure
N.	CONTINUES HARD TURN Visual-Pitch att: constant Bank att: constant Target Aural-Normal aircraft sound, *communication - WSO AOA tone Control-Increased stabilator pressure Motion-Increased positive G, pitch & roll stabilized	Determines defender approaching gun range & attack imminent	CR-4a N 257 1 C: VA CM; 2 Me: MC; 3 Mo: A A-C; CP; Ck St 45; 90; V-2 Checks six, increases stabilator pressure
O.	PREPARES FOR GUN ATTACK & LAST DITCH JINK OUT Visual-Pitch att: constant Bank att: constant Target Aural-Chg. in aircraft sound, *communication - WSO AOA tone Control-Increased stabilator pressure Motion-Increased positive G	Anticipates gun attack & last ditch maneuver Sustains turn	CR-4a O 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A A-C; CP; Ail St 40; 80; V-2 Maintains required aileron & stabilator control
P.	STARTS MAX TURN & ANTICIPATES LAST DITCH JINK OUT Visual-Pitch att: constant Bank att: constant Target Aural-Normal aircraft sound, *communication - WSO AOA tone Control-Constant aileron & stabilator pressure Motion-Constant positive G	Determines defender within gun range & need to start break into defender	CR-4a P 200 1 C: VA CM; 2 Me: MC; 3 Mo: P A-C; CP; Ail (Rd) St 40; 200; V-5 Coordinates aileron & rudder pressure, moves stabilator

SITUATION Attacker fails to Yo-Yo and overshoots due to excess energy.

TASK NO. CR-4a TASK Reversal/Controlled Range AIRCRAFT F-4E

TASK GOAL Attacker to become defender DATE Sept., 1977

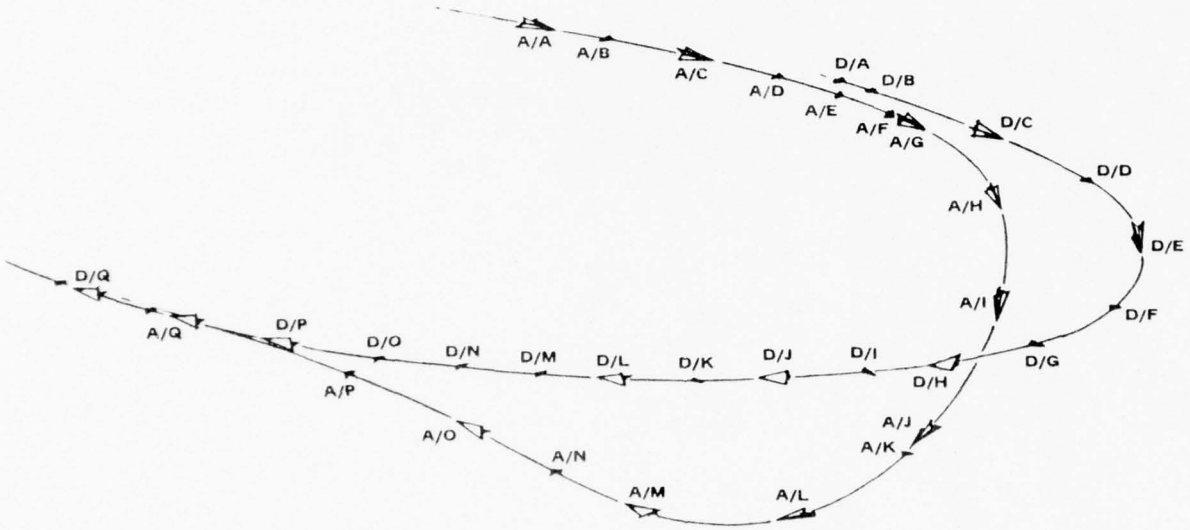
EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
Q.	VIEWS GUN ATTACK & STARTS LAST DITCH MANEUVER Visual-Pitch att: descending Bank att: rolling Target Narrowing vision Aural-Chg. in aircraft sound, AOA tone Control-Increased aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching down, rolling	Determines need for last ditch jink out	CR-4a Q 37 1 C: VA, CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: SP; Motor Output: SC, RU Input Index: 60; I/O Index: 120; Output Index: V-2 Moves stabilator & (top) rudder
R.	CONTINUES LAST DITCH JINK OUT Visual-Pitch att: varying Bank att: rolling Aural-Chg. in aircraft sound Control-Increased aileron rudder & stabilator pressure Motion-Negative G onset, pitching down, rolling, buffeting	Determines need to continue last ditch jink out	CR-4a R 277 1 C: VA, CM; 2 Me: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: SC, RU Input Index: 50; I/O Index: 100; Output Index: V-2 Moves stabilator & (top) rudder

One v One LOW YO-YO AND COUNTER LOW YO-YO

(Like Aircraft, Missile Shot, Controlled Range)

SITUATION - Attacker in approximately 5:30 position, 12,000 feet out, co-airspeed and altitude.

SITUATION - Defender in a turn at high cruise.



Low yo-yo and counter low yo-yo maneuver diagram.

SITUATION Attacker in approximately 5:30 position. 12,000 feet out, co-airspeed and altitude.

TASK NO. CR-5a TASK Low Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Low Yo-Yo to acquire closure DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	SIGHTS TARGET AND PREPARES ATTACK Visual-Pitch att: level Bank att: level Target aircraft Aural-Normal aircraft sound Control-Aileron, stabilator & rudder pressure Motion-Normal G	Anticipates attack Sustains level flight	CR5a A 327 1 C: VC; 2 Me: MR (I); 3 Mo: A QUANTITY: 2-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St INPUT INDEX: 30; I/O INPUT: 60; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
B.	STARTS ATTACK Visual-Pitch att: level Bank att: level Target aircraft Aural-Normal aircraft sound, communication Control-Aileron & stabilator pressure Motion-Normal G	Determines need for armament set up and closure with target, need to call "Tally Ho" to WSO	CR-5a B 257 1 C: VA C; 2 Me: MC; 3 Mo: A QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai Th Ds St INPUT INDEX: 30; I/O INPUT: 60; OUTPUT INDEX: V-2 Communicates, activates Master Arm switch, moves throttle, increases stabilator pressure, activates pinkie switch
C.	CONTINUES ATTACK AND STARTS TURN Visual-Pitch att: level Bank att: level Target aircraft Aural-Chg. in aircraft sound communication - WSO (calls lock-on) Control-Increased stabilator pressure, throttle advanced (AB), pinkie switch function, Master Arm function Motion-Normal G, acceleration	Determines target's turn	CR5a C 280 1 C: VA CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai Ru Rt INPUT INDEX: 50; I/O INPUT: 250; OUTPUT INDEX: V-5 Coordinates aileron & rudder with stabilator movement

SITUATION Attacker in approximately 5:30 position, 12,000 feet out, co-airspeed and altitude.

TASK NO. CR-5a TASK Low Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Low Yo-Yo to acquire closure DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
D.	CONTINUES TURNING ATTACK Visual-Pitch att: increasing Bank att: rolling Target aircraft Sight analog bar Aural-Normal aircraft sound, communication - WSO *(calls target range) Control-Increased aileron, stabilator & rudder pressure Motion-Positive G onset, pitching up, rolling	Determines satisfactory roll rate, communication - WSO	CR-5a D 280 1 C: VA CM; 2 Mc: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: {Ai Ru/St} Input Index: 55; I/O Input: 275; Output Index: V-5 Maintains coordinated aileron & rudder, increased stabilator pressure
E.	ESTABLISHES TURNING ATTACK AND STOPS ROLL IN Visual-Pitch att: increasing Bank att: rolling Target aircraft Sight analog bar Aural-Normal aircraft sound, *communication - WSO Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Increasing positive G, pitching up, rolling	Determines proper bank attitude approaching & stagnated position	CR-5a E 260 1 C: VA CM; 2 Mc: MC; 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: {Ai Ru/St} Input Index: 55; I/O Input: 275; Output Index: V-5 Coordinates aileron & rudder movement, maintains stabilator pressure
F.	MAINTAINS TURNING ATTACK/PREPARES YO-YO Visual-Pitch att: constant Bank att: stabilized Target aircraft Sight analog bar Aural-Normal aircraft sound, *communication - WSO Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Anticipates low yo-yo to close Sustains turn	CR-5a F 337 1 C: VA CM; 2 Mc: MR (I); 3 Mo: A Quantity: 4-C; Decision Proc: CP; Motor Output: {Ai Sc} Input Index: 45; I/O Input: 90; Output Index: V-2 Maintains required aileron & stabilator control
G.	STARTS YO-YO/ALTERS TURN Visual-Pitch att: constant Bank att: constant Target aircraft Sight analog bar Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch & roll	Determines target lead point & need to pull inside target aircraft	CR-5a G 280 1 C: VA CM; 2 Mc: MC; 3 Mo: R Quantity: 4-C; Decision Proc: CP; Motor Output: {Ai Ru/St} Input Index: 50; I/O Input: 250; Output Index: V-5 Coordinates aileron & rudder pressure with stabilator movement

SITUATION Attacker in approximately 5:30 position, 12,000 feet out, co-airspeed and altitude.

TASK NO. CR-5a TASK Low Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Low Yo-Yo to acquire closure DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
H.	ESTABLISHES TURN & STARTS DESCENT Visual-Pitch att: increasing Bank att: rolling Target aircraft Sight analog bar Aural-Normal aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Increased positive G, pitching up, rolling	Determines proper lead point (bank) achieved & need to unload G to acquire acceleration	CR-5a H 280 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Ru/St 55; 215; V-5 Coordinates aileron & rudder pressure, moves stabilator
I.	CONTINUES DESCENT IN ESTABLISHED TURN Visual-Pitch att: decreasing Bank att: stabilized Target aircraft Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron & rudder pressure, decreased stabilator pressure Motion-Decreasing positive G, pitching down, roll stabilized	Determines satisfactory pitch movement & bank attitude	CR-5a I 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; St Ai Ru 60; 120; V-2 Relaxes stabilator pressure, maintains constant aileron & rudder pressure
J.	ESTABLISHES DESCENDING TURN Visual-Pitch att: decreasing Bank att: constant Target aircraft Sight analog bar Flt.Inst: cross-check Aural-Chg. in aircraft sound, *communication - WSO Control-Decreased stabilator pressure, constant aileron & rudder pressure Motion-Unloaded G, pitching down, constant roll	Determines proper pitch & bank attitude achieved	CR-5a J 260 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; CP; Ai Ru/St 65; 325; V-5 Coordinates aileron & rudder pressure with constant stabilator pressure
K.	PREPARES TURNING PULL UP Visual-Pitch att: constant (dive) Bank att: constant Target aircraft Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Neutral aileron & rudder pressure, constant stabilator pressure Motion-Unloaded G, pitch stabilized, constant roll	(Sufficient energy, lead & altitude separation approaching) Anticipates smooth G pull & missile delivery Sustains turning descent	CR-5a K 337 1 C: VA CM; 2 Me: MC (I); 3 Mo: A 4C; CP; Ai St 50; 100; V-2 Maintains required aileron & stabilator control

SITUATION Attacker in approximately 5:30 position, 12,000 feet out, co-airspeed and altitude.

TASK NO. CR-5a TASK Low Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform Low Yo-Yo to acquire closure DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
L.	STARTS TURNING PULL UP Visual-Pitch att: constant Bank att: constant Target aircraft Sight analog bar Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Unloaded G, constant pitch & roll	Determines position to initiate pull back into target's plane	CR-5a L 280 1 C: VA/CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: {Ai/R4/St INPUT INDEX: 50; I/O INDEX: 250; OUTPUT INDEX: V-5 Moves stabilator, coordinates aileron & rudder pressure
M.	CONTINUES TURNING PULL Visual-Pitch att: increasing Bank att: constant Target aircraft Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Positive G onset, pitching up, constant roll	Determines satisfactory G (pitch rate) movement & bank attitude (lead)	CR-5a M 274 1 C: VA/CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPU: St INPUT INDEX: 60; I/O INDEX: 60; OUTPUT INDEX: V-1 Maintains constant stabilator pressure
N.	ESTABLISHES CLIMB RATE AND ALTERS TURN Visual-Pitch att: increasing Bank att: constant Target aircraft Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Constant stabilator pressure Motion-Constant positive G, pitching up, constant roll	Determines proper G loading achieved & need to change bank to refine lead point	CR-5a N 280 1 C: VA/CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: {Ai/R4/St INPUT INDEX: 50; I/O INDEX: 250; OUTPUT INDEX: V-5 Coordinates aileron & rudder pressure, relaxes stabilator pressure
O.	STARTS TURNING ATTACK Visual-Pitch att: decreasing Bank att: rolling Target Sight analog bar Aural-Chg. in aircraft sound, communication - WSO **(calls range & missile parameters) Control-Increased aileron, & rudder pressure with decreased stabilator pressure Motion-Decreasing positive G, pitching up, rolling	Determines lead point to arrive at missile parameters	CR-5a O 280 1 C: VA/CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: {Ai/R4/St INPUT INDEX: 60; I/O INDEX: 300; OUTPUT INDEX: V-5 Coordinates aileron & rudder pressure, increased stabilator pressure

SITUATION Attacker in approximately 5:30 position, 12,000 feet out, co-airspeed and altitude.

TASK NO. CR-5a TASK Low Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

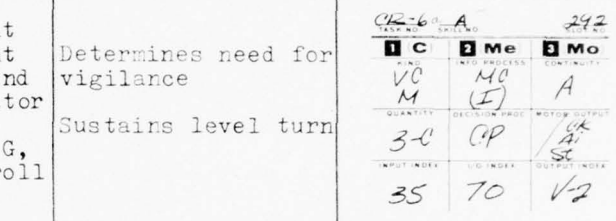
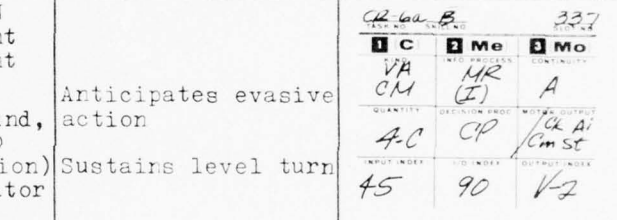
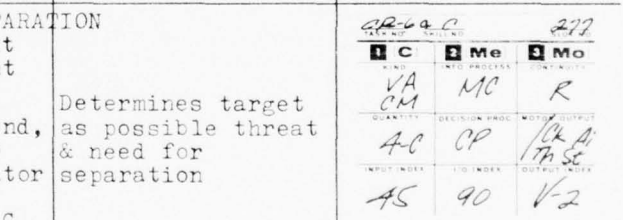
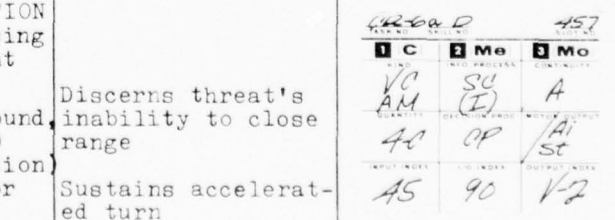
TASK GOAL Perform Low Yo-Yo to acquire closure DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
P.	CONTINUES TURNING ATTACK AND Visual-Pitch att: increasing Bank att: rolling Target/sight Aural-Chg. in aircraft sound **communication - WSO Control-Aileron & rudder pressure, increased stabilator pressure Motion-Increased positive G, pitching up, rolling	BEGINS TRACKING Determines proper missile parameters approaching	CR-5a P 259 1 C: VA CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai Ro St INPUT INDEX: 55; I/O INDEX: 275; OUTPUT INDEX: V-4 Maintains required variable aileron, rudder & stabilator pressure
Q.	PRESSES TURNING ATTACK AND EXPENDS ORDNANCE Visual-Pitch att: constant °(variable with target) Bank att: stabilized Target/pipper Sight analog bar Aural-Chg. in aircraft sound, **communication - WSO Control-Aileron, rudder & stabilator pressure Motion-°Constant positive G, pitch stabilized, °constant roll	Determines inside missile parameter & proper tracking solution to fire	CR-5a Q 257 1 C: VA CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: Ai St Ro Ds INPUT INDEX: 60; I/O INDEX: 120; OUTPUT INDEX: V-2 Maintains required variable aileron, stabilator & rudder control, activates trigger
R.	CONTINUES TRACKING Visual-Pitch att: °constant Bank att: °constant Target/pipper Sight analog bar Aural-Normal aircraft sound, Control-Aileron, stabilator & rudder pressure, trigger (missile) function Motion-°Constant positive G, °constant pitch & roll	Determines need to tighten turn to stay with target and need to call "Fox 2"	CR-5a R 272 1 C: VC M; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: St Ds Cm INPUT INDEX: 55; I/O INDEX: 110; OUTPUT INDEX: V-2 Increases stabilator pressure, activates mic. button, communicates

SITUATION Defender in a turn at high cruise.

TASK NO. CR-6a TASK Counter Low Yo-Yo/Controlled Range AIRCRAFT F-4E

TASK GOAL To keep attacker out of lethal cone DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	ESTABLISHES LEVEL TURN Visual-Pitch att: constant Bank att: constant Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch & roll	Determines need for vigilance Sustains level turn	 Checks 360°, maintains required aileron & stabilator control
B.	PREPARES DEFENSIVE ACTION Visual-Pitch att: constant Bank att: constant Target aircraft Aural-Normal aircraft sound, communication - WSO (calls target position) Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch & roll	Anticipates evasive action Sustains level turn	 Checks six, communicates - WSO, maintains required aileron & stabilator control
C.	CONTINUES TURN/STARTS SEPARATION Visual-Pitch att: constant Bank att: constant Target aircraft Aural-Normal aircraft sound, communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch & roll	Determines target as possible threat & need for separation	 Checks six, moves throttle, moves aileron & relaxes stabilator
D.	CONTINUES TURNING SEPARATION Visual-Pitch att: decreasing Bank att: constant Threat aircraft Aural-Chg. in aircraft sound, communication - WSO *(calls threat position) Control-Reduced stabilator pressure with aileron pressure, throttle advanced (to AB) Motion-Decreased positive G	Discerns threat's inability to close range Sustains accelerated turn	 Maintains required aileron & stabilator control

SITUATION Defender in a turn at high cruise.

TASK NO. CR-6a TASK Counter Low Yo-Yo/Controlled Range AIRCRAFT F-4E

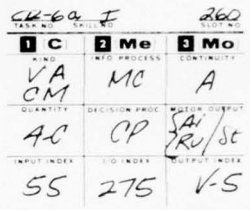
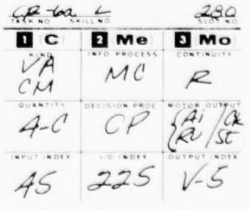
TASK GOAL To keep attacker out of lethal cone DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	ESTABLISHES TURNING EXTENSION Visual-Pitch att: level Bank att: constant Threat aircraft Flt.Inst: cross-check Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G	Discerns favorable energy state Sustains separation turn	CR-6a E 457 1 C: VA, CM — 2 Me: SC, (I) — 3 Mo: A Quantity: A-C — Decision Proc: CP — Motor Output: Ck, Al, St Input Index: 40 — I/O Index: 80 — Output Index: V-2 Checks six, maintains aileron & stabilator control
F.	MAINTAINS EXTENSION Visual-Pitch att: constant Bank att: constant Threat aircraft Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G	Determines attacker's stagnated position Sustains turn	CR-6a F 247 1 C: VA, CM — 2 Me: MC, (I) — 3 Mo: A Quantity: A-C — Decision Proc: CP — Motor Output: Ck, Al, St Input Index: 35 — I/O Index: 70 — Output Index: V-2 Checks six, maintains aileron & stabilator control
G.	STARTS CLIMB AND TIGHTENS TURN Visual-Pitch att: constant Bank att: constant Threat aircraft Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G	Determines need to counter threat's descending inside turn	CR-6a G 280 1 C: VA, CM — 2 Me: MC — 3 Mo: R Quantity: A-C — Decision Proc: CP — Motor Output: Al, Rv, St Input Index: 35 — I/O Index: 175 — Output Index: V-5 Coordinates aileron & rudder pressure with stabilator movement
H.	CONTINUES CLIMBING TURN Visual-Pitch att: increasing Bank att: rolling Threat aircraft Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching up, rolling	Determines satisfactory rate of pitch & roll movement approaching	CR-6a H 280 1 C: VA, CM — 2 Me: MC — 3 Mo: R Quantity: A-C — Decision Proc: CP — Motor Output: Al, Rv, St, Ck Input Index: 55 — I/O Index: 275 — Output Index: V-5 Checks six, maintains coordinated aileron & rudder pressure with constant stabilator pressure

SITUATION Defender in a turn at high cruise.

TASK NO. CR-6a TASK Counter Low Yo-Yo/Controlled Range AIRCRAFT F-4E

TASK GOAL To keep attacker out of lethal cone DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	STOPS CLIMB AND MAINTAINS TURN Visual-Pitch att: increasing Bank att: rolling Threat aircraft Aural-Chg. in aircraft sound, *communication - WSO Control-Constant aileron, rudder & stabilator pressure Motion-Increasing positive G, pitch increasing, rolling	Determines proper pitch and roll attitude achieved as threat continues descending turn	 Coordinates aileron & rudder pressure, relaxes stabilator pressure
J.	ESTABLISHES TIGHTENED TURN Visual-Pitch att: level Bank att: stabilized Threat aircraft Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron & rudder pressure, reduced stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Determines threat's tactics as closure maneuver Sustains turn	 Checks six, maintains required aileron & stabilator control
K.	MAINTAINS TURN Visual-Pitch att: level Bank att: constant Threat aircraft Flt.Inst: cross-check Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Determines acceptable energy state & position Sustains turn	 Maintains required aileron & stabilator control
L.	STARTS DEFENSIVE TURN Visual-Pitch att: level Bank att: constant Threat aircraft Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Determines threat's pull up and closure, & need to counter	 Checks six, coordinates aileron & rudder pressure with increased stabilator pressure

SITUATION Defender in a turn at high cruise.

TASK NO. CR-6a TASK Counter Low Yo-Yo/Controlled Range AIRCRAFT F

TASK GOAL To keep attacker out of lethal cone DATE Sept.

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACT
M.	CONTINUES DEFENSIVE TURN Visual-Pitch att: increasing Bank att: rolling Threat aircraft Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching up, rolling	Determines satisfactory roll rate to turn down into threat	CR-6a M 1 C: VA CM; 2 Me: MC QUANTITY: 4-C; DECISION PROC: CP INPUT INDEX: 55; I/O INDEX: 275 Checks six, maintains coor aileron & rudd increased stab pressure
N.	CONTINUES DEFENSE/TIGHTENS TURN Visual-Pitch att: decreasing Bank att: rolling Target aircraft Aural-Chg. in aircraft sound, *communication - WSO, AOA tone Control-Constant aileron & rudder pressure with increased stabilator pressure Motion-Increasing positive G, pitching down, rolling	Determines threat must turn corner, and need for countering with max. turn	CR-6a N 1 C: VA CM; 2 Me: MC QUANTITY: 4-C; DECISION PROC: CP INPUT INDEX: 60; I/O INDEX: 300 Maintains coor aileron & rudd pressure with increasing sta pressure
O.	STARTS MAX. BREAKING TURN Visual-Pitch att: decreasing Bank att: stabilized Aural-Chg. in aircraft sound, AOA tone Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Increasing positive G, pitching down, constant roll	Determines threat's position approaching lethal cone	CR-6a O 1 C: VA CM; 2 Me: MC QUANTITY: 4-C; DECISION PROC: CP INPUT INDEX: 50; I/O INDEX: 50 Moves stabilat
P.	CONTINUES MAX. TURN Visual-Pitch att: constant Bank att: constant Narrow vision onset Aural-Chg. in aircraft sound, AOA tone Control-Neutral aileron & rudder, increased stabilator pressure Motion-Increasing positive G, pitch & roll constant, increased buffeting, vibration	Determines max. turn achieved	CR-6a P 1 C: VA CM; 2 Me: MC QUANTITY: 4-C; DECISION PROC: SP INPUT INDEX: 55; I/O INDEX: 55 Maintains cons stabilator pre

SITUATION Defender in a turn at high cruise.

TASK NO. CR-6a TASK Counter Low Yo-Yo/Controlled Range AIRCRAFT F-4

TASK GOAL To keep attacker out of lethal cone DATE Sept.,

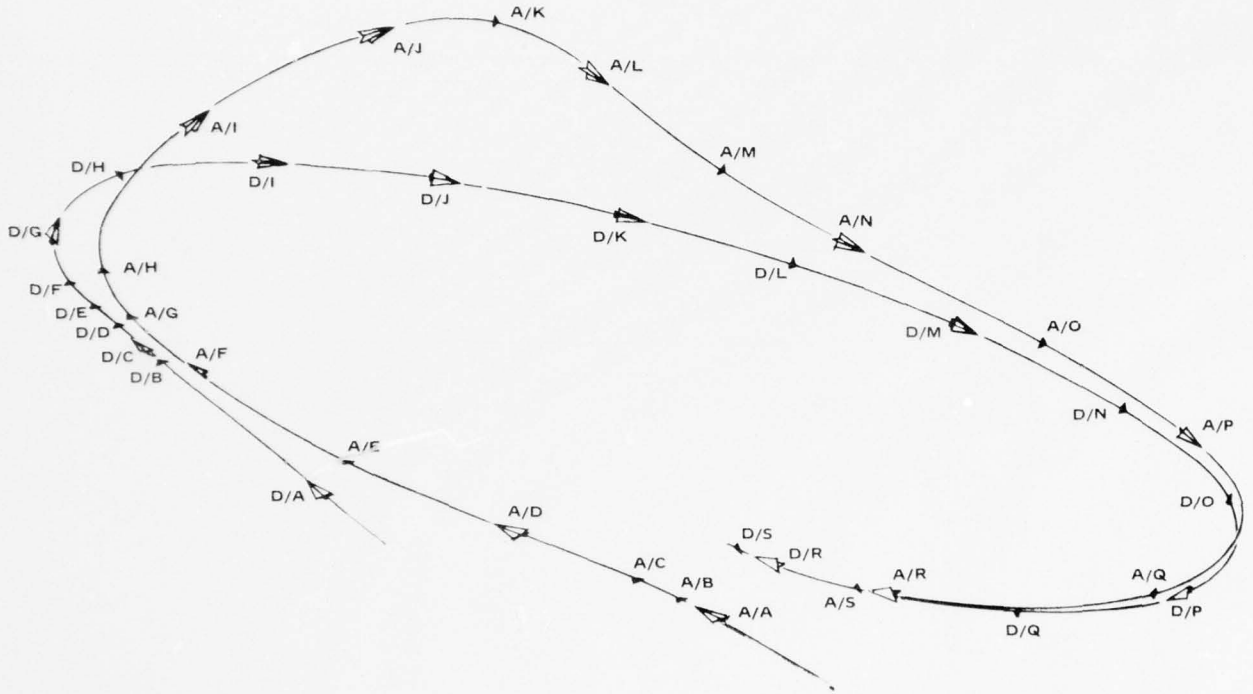
EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTIO
Q.	ESTABLISHES MAX. TURN Visual-Pitch att: constant Bank att: constant Gray out Aural-Chg. in aircraft sound, AOA tone Control-Constant stabilator pressure Motion-Constant positive G, constant pitch & roll, constant buffeting, vibration	Sustains max. turn	CR-6a Q 1 C / 2 Me / 3 M VA / I / A C M 4-C / SP / A/ 2 55 / 110 / V- Maintains requir aileron, rudder stabilator contr

One v One HIGH YO-YO AND COUNTER HIGH YO-YO

(Tracking Gun Shot, Like Aircraft, Controlled Range)

SITUATION - Attacker approximately 4:30 position, 12,000 feet out and 5,000 feet higher, high cruise.

SITUATION - Defender in level flight at cruise power.



High yo-yo and counter high yo-yo maneuver diagram.

SITUATION Attacker approximately 4:30 position, 12,000 feet out and 5,000 feet higher, high cruise.

TASK NO. CR-7a TASK High Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform High Yo-Yo to prevent overshoot DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	SIGHTS TARGET AND PREPARES ATTACK Visual-Pitch att: level Bank att: level Target aircraft Aural-Normal aircraft sound Control-Aileron, stabilator & rudder pressure Motion-Normal G	Anticipates attack Sustains level flight	CR-7a A 327 1 C: VC; 2 Me: MR (I); 3 Mo: A QUANTITY: 2C; DECISION PROC: CP; MOTOR OUTPUT: Ai/St INPUT INDEX: 30; I/O INDEX: 60; OUTPUT INDEX: V-2 Maintains required aileron & stabilator control
B.	STARTS ATTACK ROLL IN AND DESCENT Visual-Pitch att: level Bank att: level Target aircraft Armament panel Aural-Normal aircraft sound, Control-Aileron & stabilator pressure Motion-Normal G	Determines need for armament set up, closure with target & tell WSO to go "stab. out"	CR-7a B 275 1 C: VA C; 2 Me: MC; 3 Mo: R QUANTITY: 3-C; DECISION PROC: CP; MOTOR OUTPUT: Ai/Th/St/Us INPUT INDEX: 35; I/O INDEX: 175; OUTPUT INDEX: V-5 Activates Master Arm, coordinates aileron & rudder movement with stabilator & throttle movement, activates pinkie switch, communicates
C.	CONTINUES ROLL IN AND DESCENT Visual-Pitch att: decreasing Bank att: rolling Target aircraft Aural-Chg. in aircraft sound, communication - WSO (calls target range) Control-Increased aileron, rudder & stabilator pressure, throttle advance (AB), Master Arm function, pinkie switch function Motion-Positive G onset, acceleration, pitching down, rolling	Determines satisfactory pitch & roll rate to lead & close on target	CR-7a C 280 1 C: VA CM; 2 Me: MC; 3 Mo: R QUANTITY: 4C; DECISION PROC: CP; MOTOR OUTPUT: Ai/Rd/St INPUT INDEX: 75; I/O INDEX: 375; OUTPUT INDEX: V-5 Maintains coordinated aileron & rudder pressure with increased stabilator pressure

SITUATION Attacker approximately 4:30 position, 12,000 feet out and 5,000 feet higher, high cruise.

TASK NO. CR-7a TASK High Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform High Yo-Yo to prevent overshoot DATE Sept., 1977

TI. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
D.	ALTERS ROLL AND MAINTAINS DESCENDING ATTACK Visual-Pitch att: decreasing Bank att: rolling Target aircraft Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Unloaded G, acceleration, pitching down, rolling	Discerns target beginning steep level turn	CR-7a D 200 1 C: VA CM; 2 Me: SC; 3 Mo: R 4-C; SP; (Ai (Rj / St 55; 275; V-S Increased coordinated aileron & rudder pressure, increased stabilator pressure
E.	STOPS ROLL AND DESCENT, AND GAINS RADAR LOCK-ON Visual-Pitch att: decreasing Bank att: rolling Target aircraft Sight analog bar Aural-Normal aircraft sound, communication - WSO (calls range & overtake) Control-Increased aileron & rudder pressure, increased stabilator pressure Motion-Unloaded G, pitching down, rolling	Determines proper pitch & bank attitude approaching	CR-7a E 274 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; (Ai (Rj (St 55; 220; V-A Coordinates aileron, rudder & stabilator movement
F.	ESTABLISHES TURNING ATTACK Visual-Pitch att: descent (constant) Bank att: constant Target aircraft Sight analog bar Aural-Normal aircraft sound, communication - WSO *(calls range and closure rate) Control-Neutral aileron & rudder pressure, increased stabilator pressure Motion-Positive G, roll stabilized	Determines need to maintain position behind target	CR-7a F 256 1 C: VA CM; 2 Me: MC; 3 Mo: A 4-C; CP; St A0; A0; V-1 Maintains stabilator pressure

SITUATION Attacker approximately 4:30 position, 12,000 feet out and 5,000 feet higher, high cruise.

TASK NO. CR-7a TASK High Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform High Yo-Yo to prevent overshoot DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
G.	PRESSES TURNING ATTACK Visual-Pitch att: constant Bank att: constant Target aircraft Sight analog bar Aural-Normal aircraft sound, *communication - WSO Control-Constant stabilator pressure Motion-Constant positive G, constant pitch & roll	Anticipates pull out of target's plane Sustains turning attack	CR-7a G 337 1 C: VA, CM; 2 Me: MR, (I); 3 Mo: A 4C; CP; St, Ai 45; 90; V-2 Maintains required aileron & stabilator control
H.	STARTS PULL UP INTO HIGH YO-YO Visual-Pitch att: constant Bank att: constant Target aircraft Sight analog bar Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch & roll	Determines position to begin pull up & out of target's flight plane	CR-7a H 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R 4C; CP; Ai, Rd, St 50; 250; V-5 Coordinates aileron & rudder, moves stabilator
I.	CONTINUES PULL UP AND TURN Visual-Pitch att: increasing Bank att: rolling Target aircraft/canopy Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Constant positive G, pitching up, rolling	Determines satisfactory pitch & roll movement (NOTE: the use of AB the entire maneuver or save fuel & go to idle and apex on a lower Yo-Yo is decided at this point.)	CR-7a I 277 1 C: VA, CM; 2 Me: MC; 3 Mo: R 4C; CP; Ai, St 60; 120; V-2 Maintains aileron pressure & relaxes stabilator pressure
J.	STOPS PULL UP AND CONTINUES TURN Visual-Pitch att: increasing Bank att: rolling Target aircraft/canopy Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Constant aileron, reduced stabilator pressure Motion-Constant positive G, pitching up, roll stabilized	Determines target unloading turn (NOTE: radar probably will not break lock during a properly executed Yo-Yo.)	CR-7a J 277 1 C: VA, CM; 2 Me: MC; 3 Mo: R 4C; CP; Ai, St 55; 110; V-2 Increased aileron & stabilator pressure

SITUATION Attacker approximately 4:30 position, 12,000 feet out and 5,000 feet higher, high cruise.

TASK NO. CR-7a TASK High Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform High Yo-Yo to prevent overshoot DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
K.	REACHES APEX AND TURNS Visual-Pitch att: decreasing Bank att: rolling Target aircraft/canopy Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron & stabilator pressure Motion-Decreasing positive G, pitch stabilizing, rolling	Determines satisfactory pitch & roll relative to target's position	CR-7a K 276 1 C: VA CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: St INPUT INDEX: 55; I/O INDEX: 55; OUTPUT INDEX: V-1 Maintains constant stabilator pressure
L.	STARTS PULL DOWN AND TURN BACK TO TARGET Visual-Pitch att: decreasing Bank att: stabilized Target aircraft/canopy Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Constant stabilator pressure Motion-Positive G, pitching down, rolling	Determines target's lead position	CR-7a L 279 1 C: VA CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: (Ai Ro St) INPUT INDEX: 50; I/O INDEX: 200; OUTPUT INDEX: V-4 Coordinates aileron, rudder & stabilator movement
M.	CONTINUES PULL DOWN AND TURN Visual-Pitch att: decreasing Bank att: rolling Target aircraft/canopy Sight analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, stabilator & rudder pressure Motion-Increasing positive G, pitching down, rolling	Determines pitch & roll rate satisfactory for lead estimate- as target pulls into tighter level turn	CR-7a M 280 1 C: VA CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: (Ai Ro St) INPUT INDEX: 60; I/O INDEX: 300; OUTPUT INDEX: V-5 Maintains coordinated aileron & rudder, increases stabilator pressure
N.	STOPS PULL DOWN AND CONTINUES TURN Visual-Pitch att: decreasing Bank att: rolling Target Sight Aural-Chg. in aircraft sound, *communication - WSO Control-Constant aileron & rudder, increased stabilator pressure Motion-Increased positive G, pitching down, rolling	Determines proper pitch attitude approaching & need to pull into target	CR-7a N 280 1 C: VA CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: (Ai Ro St) INPUT INDEX: 65; I/O INDEX: 325; OUTPUT INDEX: V-5 Coordinates aileron & rudder, increases stabilator pressure

SITUATION Attacker approximately 4:30 position, 12,000 feet out and 5,000 feet higher, high cruise.

TASK NO. CR-7a TASK High Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform High Yo-Yo to prevent overshoot DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
O.	ESTABLISHES TURN AND NEARING Visual-Pitch att: increasing Bank att: stabilized Target/sight Aural-Normal aircraft sound, *communication - WSO Control-Neutral aileron & rudder pressure, increased stabilator pressure Motion-Increased positive G, pitching up, roll stabilized	GUN PARAMETERS Determines need for trim	CR-7a Q 17 1 C: VA, CM — 2 Me: MC — 3 Mo: A 4-C — SP — IF, SE AS — 90 — V-2 Activates trim switch & maintains stabilator pressure
P.	STARTS TURNING ATTACK Visual-Pitch att: stabilized Bank att: constant Target/sight Aural-Normal aircraft sound Control-Constant stabilator pressure, trim switch function Motion-Constant positive G, pitch stabilized, roll constant	Sustains turning attack	CR-7a P 392 1 C: VC, M — 2 Me: I — 3 Mo: R 3-C — CP — AI, RU, SE AS — 90 — V-2 Maintains required (variable) aileron, stabilator & rudder pressure
Q.	CONTINUES TURNING ATTACK AND Visual-Pitch att: constant °(variable) Bank att: °constant Target/sight Aural-Normal aircraft sound, communication - WSO (calls lock-on) Control-Aileron, stabilator & rudder pressure Motion-°Constant positive G, °constant pitch & roll	ACQUIRES LOCK-ON Determines need to begin tracking solution	CR-7a Q 277 1 C: VA, CM — 2 Me: MC — 3 Mo: R 4-C — CP — AI, RUDS SS — 110 — V-2 Maintains required (variable) aileron & rudder control, increases stabilator pressure
R.	PRESSES ATTACK AND EXPENDS ORDNANCE Visual-Pitch att: °constant Bank att: °constant Target/pipper Aural-Normal aircraft sound, communication - WSO Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-°Constant positive G, °Constant pitch & roll	Determines proper range & tracking solution & position to fire	CR-7a R 277 1 C: VA, CM — 2 Me: MC — 3 Mo: R 4C — CP — AI, RUDS SS — 110 — V-2 Maintains required (variable) aileron, stabilator & rudder pressure; activates trigger

SITUATION Attacker approximately 4:30 position, 12,000 feet out and 5,000 feet higher, high cruise.

TASK NO. CR-7a TASK High Yo-Yo (Attacker)/Controlled Range AIRCRAFT F-4E

TASK GOAL Perform High Yo-Yo to prevent overshoot DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
S.	CONTINUES TRACKING AND CEASES FIRE Visual-Pitch att: °constant Bank att: °Constant Target/pipper Aural-Normal aircraft sound, communication - Pilot (calls "Fox 3") Control-Constant aileron, rudder & stabilator pressure; trigger function Motion-°Constant positive G, °constant pitch & roll	Discerns target jinking and sustains position behind target	CR-7a S 477 1 C: VA, CM; 2 Me: SC, (I); 3 Mo: R 4-C, C·P, SL 60, 120, V-2 Deactivates trigger, maintains required (variable) aileron, stabilator & rudder control

SITUATION Defender in level flight at cruise power.

TASK NO. CR-8a TASK Counter High Yo-Yo/Controlled Range AIRCRAFT F-4E

TASK GOAL To keep attacker out of lethal cone DATE Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
A.	CONTINUES CRUISE FLIGHT Visual-Pitch att: level Bank att: level Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines need for constant vigilant posture Sustains level flight	CR-8a A 287 1 C: VC; 2 Me: MC (I); 3 Mo: A 2-C; CP; Ai St 20; 40; V-2 Checks 360°, maintains required aileron & stabilator control
B.	PREPARES DEFENSIVE ACTION Visual-Pitch att: level Bank att: level Target aircraft Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Anticipates evasive action Sustains level flight	CR 8a B 327 1 C: VC; 2 Me: MR (I); 3 Mo: A 2-C; CP; Ai St 25; 50; V-2 Maintains required aileron & stabilator control
C.	STARTS TURN INTO THREAT Visual-Pitch att: level Bank att: level Threat Aural-Normal aircraft sound, communication - WSO *(threat position) Control-Aileron & stabilator pressure Motion-Normal G	Discerns target as threat	CR-8a C 435 1 C: VA C; 2 Me: SC; 3 Mo: R 3-C; CP; {Ai R St / Th Com} 30; 150; V-5 Coordinates aileron & rudder with stabilator movement, and moves throttle (to AB) communicates (to WSO)
D.	CONTINUES ROLL IN TO TURN Visual-Pitch att: increasing Bank att: rolling Threat Aural-Chg. in aircraft sound *communication - WSO Control-Increased aileron, rudder & stabilator pressure, throttle advance Motion-Positive G onset, acceleration, pitching up, rolling	Determines satisfactory roll rate & need to maintain visual target contact	CR-8a D 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai R St 65; 130; V-2 Checks six, maintains aileron & rudder with increased stabilator movement

SITUATION Defender in level flight at cruise power.

TASK NO. CR-8a TASK Counter High Yo-Yo/Controlled Range AIRCRAFT F-4E

TASK GOAL To keep attacker out of lethal cone DATE Sept., 197

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	STOPS ROLL IN AND TIGHTENS TURN Visual-Pitch att: increasing Bank att: rolling Threat Aural-Chg. in aircraft sound Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Increased positive G, pitching up, rolling	Determines desired bank & need to tighten turn	CR-8a E 260 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: {Ai/Rr/Sc} INPUT INDEX: 50; I/O INDEX: 250; OUTPUT INDEX: V-5 Checks six, coordina aileron & rudder, increases stabilato pressure
F.	ESTABLISHES DEFENSIVE TURN Visual-Pitch att: stabilized Bank att: constant Threat Aural-Chg. in aircraft sound, AOA tone Control-Neutral aileron & rudder pressure, increased stabilator pressure Motion-Increased positive G, pitch & roll stabilized, buffeting onset	Determines satisfactory turn in relation to threat & need for trim	CR-8a F 257 1 C: VA, CM; 2 Me: MC; 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: {Ck/Tr} INPUT INDEX: 50; I/O INDEX: 100; OUTPUT INDEX: V-2 Checks six, adjusts trim, & relaxes stabilator pressure
G.	CONTINUES DEFENSIVE TURN Visual-Pitch att: constant Bank att: constant Threat Aural-Normal aircraft sound, AOA tone Control-Decreased stabilator pressure Motion-Constant positive G, pitch & roll constant, buffeting	Discerns threat's high closure rate Sustains level high G turn	CR-8a G 457 1 C: VA, CM; 2 Me: SC, (I); 3 Mo: A QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: {Ck/Ai/Sc} INPUT INDEX: 45; I/O INDEX: 90; OUTPUT INDEX: V-2 Checks six, maintains required aileron & stabilato control
H.	STARTS UNLOADING TURN FOR EXTENSION Visual-Pitch att: constant Bank att: constant Threat Aural-Normal aircraft sound, AOA tone, communication - WSO **(threat's position) Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant, buffeting	Determines a counter to threat's roll & climb	CR-8a H 280 1 C: VA, CM; 2 Me: MC; 3 Mo: R QUANTITY: 4-C; DECISION PROC: CP; MOTOR OUTPUT: {Ai/Rr/Sc} INPUT INDEX: 55; I/O INDEX: 275; OUTPUT INDEX: V-5 Coordinates aileron & rudder, relaxes stabilator pressure

SITUATION Defender in level flight at cruise power.

TASK NO. CR-8a TASK Counter High Yo-Yo/Controlled Range AIRCRAFT F-4E

TASK GOAL To keep attacker out of lethal cone DATE Sept., 197

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
I.	CONTINUES SEPARATION TURN Visual-Pitch att: decreasing Bank att: rolling Threat Aural-Chg. in aircraft sound, **communication - WSO Control-Increased aileron & rudder with decreased stabilator pressure Motion-Decreasing G, pitching down, rolling	Determines satisfactory pitch & roll movement	CR-8a I 280 1 C: VA CM; 2 Me: MC; 3 Mo: R AC; CP; A/C 2/SC 55; 275; V-5 Checks six, maintai coordinated aileron rudder with relaxed stabilator pressure
J.	STOPS UNLOADING TURN Visual-Pitch att: decreasing Bank att: rolling Threat Aural-Chg. in aircraft sound, **communication - WSO Control-Increased aileron & rudder pressure, reduced stabilator pressure Motion-Decreasing positive G, pitching down, rolling	Determines proper tactical position & energy state achieved	CR-8a J 257 1 C: VA CM; 2 Me: MC; 3 Mo: A AC; CP; A/C A/SC 55; 110; V-2 Checks six, maintai aileron, rudder & stabilator pressure
K.	ESTABLISHES TURN Visual-Pitch att: stabilized Bank att: constant Threat Aural-Chg. in aircraft sound, **communication - WSO Control-Constant aileron & rudder, constant stabilator pressure Motion-Constant positive G, pitch & roll stabilized	Sustains separation turn Anticipates countering threat's tactical position	CR-8a K 337 1 C: VA CM; 2 Me: MR (I); 3 Mo: A AC; CP; A/C SC 55; 110; V-2 Maintains required aileron & stabilato control
L.	CONTINUES TURN Visual-Pitch att: constant Bank att: constant Threat Aural-Normal aircraft sound, **communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Discerns threat Sustains turn	CR-8a L 217 1 C: VA CM; 2 Me: SC (I); 3 Mo: A AC; SP; C/A SC 45; 40; V-2 Checks six, maintai required aileron & stabilator control

SITUATION Defender in level flight at cruise power.

TASK NO. CR-8a TASK Counter High Yo-Yo/Controlled Range AIRCRAFT F

TASK GOAL To keep attacker out of lethal cone DATE Sept.

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR AC
M.	RESUMES DEFENSIVE TURN Visual-Pitch att: constant Bank att: constant Threat Aural-Normal aircraft sound, **communication - WSO Control-Aileron & stabilator pressure Motion-Constant positive G, pitch & roll constant	Determines threat will not overshoot, & need for tighter turn	CR-8a M 1 C: VA, CM 2 Me: MC QUANTITY: AC DECISION PROC: CP INPUT INDEX: 45 I/O INDEX: 225 Checks six, coordinates a & rudder with stabilator mo
N.	CONTINUES DEFENSIVE TURN Visual-Pitch att: increasing Bank att: rolling Threat Aural-Chg. in aircraft sound, **communication - WSO AOA tone Control-Increased aileron, rudder & stabilator pressure Motion-Increasing positive G, pitching up, rolling, buffeting onset	Determines pitch & bank rate satisfactory	CR-8a N 1 C: VA, CM 2 Me: MC QUANTITY: 4-C DECISION PROC: CP INPUT INDEX: 65 I/O INDEX: 130 Maintains ail rudder pressu increased sta pressure
O.	ESTABLISHES BANK AND TIGHTENS TURN Visual-Pitch att: increasing Bank att: rolling Threat Aural-Chg. in aircraft sound, **communication - WSO AOA tone Control-Constant aileron & rudder pressure, increased stabilator pressure Motion-Increasing positive G, pitching up, rolling, buffeting	Determines proper pitch & roll approaching	CR-8a O 1 C: VA, CM 2 Me: MC QUANTITY: AC DECISION PROC: CP INPUT INDEX: 65 I/O INDEX: 325 Checks six, coordinates & rudder with stabilator pr
P.	CONTINUES DEFENSIVE TURN Visual-Pitch att: stabilized Bank att: constant Threat Aural-Normal aircraft sound, **communication - WSO AOA tone Control-Neutral aileron & rudder, increased stabilator pressure Motion-Constant positive G, pitch & roll stabilized, constant buffet	Discerns threat's position Sustains turn	CR-8a P 1 C: VA, CM 2 Me: SC (I) QUANTITY: AC DECISION PROC: SP INPUT INDEX: 50 I/O INDEX: 100 Checks six, maintains re aileron & st control

SITUATION Defender in level flight at cruise power.

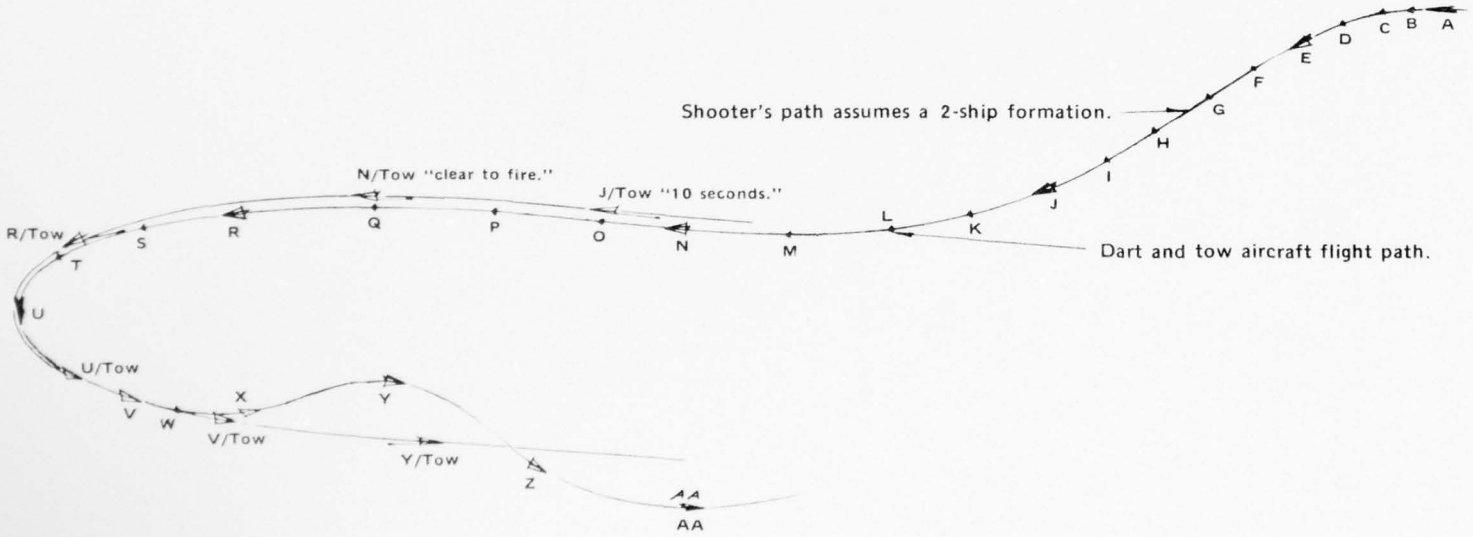
TASK NO. CR-8a TASK Counter High Yo-Yo/Controlled Range AIRCRAFT F

TASK GOAL To keep attacker out of lethal cone DATE Sept.,

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACT
Q.	STARTS MAX. BREAKING TURN Visual-Pitch att: constant Bank att: constant Narrow vision onset Aural-Normal aircraft sound, **communication - WSO AOA tone Control-Aileron & stabilator pressure Motion-Constant positive G, constant pitch, rolling, buffeting	Determines threat's position in approaching the lethal cone	CR-8a Q 1 C: VA, CM; 2 Me: MC; QUANTITY: 4C; DECISION PROC: CP; INPUT INDEX: 55; I/O INDEX: 55 Increases stab pressure
R.	CONTINUES MAX. TURN Visual-Pitch att: constant Bank att: constant Narrowing vision Aural-Chg. in aircraft sound, AOA tone Control-Increased stabilator pressure Motion-Increasing positive G, constant pitch & roll, increased buffeting, vibration	Sustains max. turn	CR-8a R 1 C: VA, CM; 2 Me: I; QUANTITY: 4C; DECISION PROC: SP; INPUT INDEX: 55; I/O INDEX: 110 Maintains requ aileron & stab pressure
S.	STARTS JINK OUT Visual-Pitch att: constant Bank att: constant Gray out Aural-Normal aircraft sound, AOA tone Control-Aileron & stabilator control Motion-Constant positive G, constant pitch & roll, constant buffeting, vibration	Determines last ditch maneuver (Jink Out)	CR-8a S 1 C: VA, CM; 2 Me: MC; QUANTITY: 4C; DECISION PROC: CP; INPUT INDEX: 55; I/O INDEX: 55 Moves stabilat

RACETRACK PATTERN/DART FIRING

SITUATION - Two ship element in fighting wing formation, lead aircraft is the shooter, approximately 5 - 7,000 feet behind and 2 - 3,000 feet above the Dart target.



SITUATION Two ship element set up in fighting wing formation, aircraft is the shooter, approximately 5,000 - 7,000 behind DART, and 2,000 - 3,000' above DART target.

TASK NO. CR-9a TASK Racetrack Pattern DART firing AIRCR

TASK GOAL Align aircraft in DART plane and fire DATE

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTO
A.	ESTABLISHED ON PERCH Visual-Pitch att: level Bank att: level Dart Tow ship Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Determines perch position achieved Sustains level flight	CR-9a A 1 C / 2 VC 2-C 30 Maintains aileron & control
B.	CONTINUES ON PERCH POSITION Visual-Pitch att: level Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Normal aircraft sound Control-Aileron & stabilator pressure Motion-Normal G	Anticipates Dart tow calling out 30 second warning Sustains level flight	CR-9a B 1 C / 2 VC 2-C 40 Maintains aileron & pressure
C.	CONTINUES PERCH POSITION/DART Visual-Pitch att: level Bank att: level Dart Tow ship Sight analog bar Aural-Normal aircraft sound, communication - WSO (calls lock-on) Control-Aileron & stabilator pressure Motion-Normal G	LOCK-ON Determines WSO has radar locked on to Dart Sustains level flight	CR-9a C 1 C / 2 VA C 3-C 40 Maintains aileron & pressure
D.	STARTS DART CLOSURE IN A DESCENDING TURN Visual-Pitch att: level Bank att: level Dart Tow ship Flt.Inst: A/S Aural-Normal aircraft sound, communication -tow ship (30 second warning) Control-Aileron & stabilator pressure Motion-Normal G	Determines need to lower nose and increase power, acknowledges tow ship	CR-9a D 1 C / 2 VA C 3-C 40 Coordinat & rudder relaxes s pressure, throttle, mic. swit communica (to tow s

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SITUATION Two ship element set up in fighting wing formation, lead aircraft is the shooter, approximately 5,000 - 7,000' behind DART, and 2,000 - 3,000' above DART target.

TASK NO. CR-9a **TASK** Racetrack Pattern DART firing **AIRCRAFT** F-4E

TASK GOAL Align aircraft in DART plane and fire **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
E.	CONTINUES TO CLOSE RANGE ON TARGET IN A DESCENDING TURN Visual-Pitch att: decreasing Bank att: level Dart Tow ship Aural-Chg. in aircraft sound, communication Control-Increased aileron & rudder pressure, decreased stabilator pressure, throttle advance, mic. switch function Motion-Unloaded G onset, pitching down	Determines need to move inside the intended Dart turn to obtain closure rate & need for trim	CR-9a E 280 1 C: VA CM; 2 Mo: MC; 3 Mo: R A-C; CP; Ai/RU/TT/St 65; 325; V-5 Maintains coordinated aileron & rudder with relaxed stabilator pressure, adjusts trim
F.	CONTINUES TO ESTABLISH DESCENT AND TURN Visual-Pitch att: decreasing Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound, communication - WSO *(calls distance and overtake) Control-Constant aileron & rudder pressure, decreased stabilator pressure, trim switch function Motion-Unloaded G, pitching down	Determines rate of pitch, bank & acceleration satisfactory	CR-9a F 277 1 C: VA CM; 2 Mo: MC; 3 Mo: R A-C; CP; St/Ai/RU 70; 140; V-2 Maintains stabilator, aileron & rudder pressure
G.	STOPS RATE OF DESCENT AND CONTINUES TURNING Visual-Pitch att: decreasing Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound, *communication - WSO Control-Constant aileron, stabilator and rudder pressure Motion-Unloaded G, pitching down	Determines required pitch & bank attitude approaching (relative to the inside distance of the intended Dart turn)	CR-9a G 260 1 C: VA CM; 2 Mo: MC; 3 Mo: A A-C; CP; Ai/RU/St 65; 325; V-5 Coordinates aileron & rudder movement with stabilator movement

SITUATION Two ship element set up in fighting wing formation, lead aircraft is the shooter, approximately 5,000 - 7,000' behind DART, and 2,000 - 3,000' above DART target.

TASK NO. CR-9a **TASK** Racetrack Pattern DART firing **AIRCRAFT** F-4E

TASK GOAL Align aircraft in DART plane and fire **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
H.	ESTABLISHES RATE OF DESCENT (CONSTANT) Visual-Pitch att: constant Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Positive G onset, pitching down	Determines need for power adjustment and trim	CR-9a H 257 1 C: VA CM; 2 Mo: MC; 3 Mo: A A-C; CP; Th Tr St 65; 130; V-2 Adjusts throttle, adjusts trim, relaxes stabilator pressure
I.	PREPARES TO INTERCEPT PLANE OF DART Visual-Pitch att: constant Bank att: level Dart Tow ship Aural-Chg. in aircraft sound, *communication - WSO Control-Neutral stabilator pressure, trim switch function, throttle advance Motion-Normal G	Anticipates tow ship giving 10 second warning before starting turn Sustains descent	CR-9a I 92 1 C: VA C; 2 Mo: MR (I); 3 Mo: A 3-C; SP; Ai St 40; 80; V-2 Maintains required aileron & stabilator pressure
J.	STARTS INTERCEPT AS TOW SHIP Visual-Pitch att: constant Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Normal aircraft sound, communication-tow ship (calls "10 second warning") Control-Aileron & stabilator pressure Motion-Normal G	CALLS "TEN SECOND WARNING" Determines approaching plane of Dart & need to acknowledge tow ship	CR-9a J 275 1 C: VA C; 2 Mo: MC; 3 Mo: R 3-C; CP; Ai R St / Ds Cm 45; 225; V-5 Coordinates stabilator, aileron & rudder; activates mic. switch; communicates
K.	CONTINUES TO REFINE POSITION (TO INTERCEPT DART PLANE) Visual-Pitch att: increasing Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure, mic. switch function Motion-Positive G onset, pitching up	Determines satisfactory rate of pitch movement & closure rate, need for trim	CR-9a K 277 1 C: VA CM; 2 Mo: MC; 3 Mo: R A-C; CP; Tr St 70; 140; V-2 Adjusts trim, increased stabilator pressure

SITUATION Two ship element set up in fighting wing formation, lead aircraft is the shooter, approximately 5,000 - 7,000' behind DART, and 2,000 - 3,000' above DART target.

TASK NO. CR-9a **TASK** Racetrack Pattern DART firing **AIRCRAFT** F-4E

TASK GOAL Align aircraft in DART plane and fire **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
L.	ESTABLISHES INSIDE INTENDED DART TURN Visual-Pitch att: increasing Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Normal aircraft sound, *communication - WSO Control-Stabilator pressure, trim switch function Motion-Positive G, pitching up	Determines satisfactory position & closure rate	CR-9a L 276 1 C: VA CM; 2 Mo: MC; 3 Mo: R 4-C; CP; /St 55; 55; V-1 Relaxes stabilator pressure
M.	PREPARES TO START PURE PURSUIT CURVE Visual-Pitch att: increasing Bank att: level Dart Tow ship Flt.Inst: Alt, A/S Aural-Normal aircraft sound, *communication - WSO Control-Decreased stabilator pressure Motion-Decreasing positive G	Anticipates Dart starting turn & giving "clear to fire" call, and need to establish smooth lead pursuit curve Sustains level turn	CR-9a M 337 1 C: VA CM; 2 Mo: MR (I); 3 Mo: A 4-C; CP; /Ai St 45; 90; V-2 Maintains required aileron & stabilator pressure
N.	STARTS PURE PURSUIT CURVE AND CLIMB Visual-Pitch att: constant Bank att: level Dart Tow ship Aural-Normal aircraft sound, communication-tow ship (calls "cleared to fire") Control-Aileron & stabilator pressure Motion-Normal G	Determines need to start turn & acknowledge call	CR-9a N 275 1 C: VA C; 2 Mo: MC; 3 Mo: R 3-C; CP; Ai R St / DS Cm 35; 175; V-5 Coordinates aileron, rudder & stabilator pressure; activates mic switch; communicates (to tow ship)
O.	CONTINUES ROLL IN TO CLIMBING TURN (TO ESTABLISH AIRCRAFT IN DART PLANE) Visual-Pitch att: increasing Bank att: roll Dart Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound, communication Control-Increased aileron, rudder & stabilator pressure, mic.switch function Motion-Positive G onset, pitching up, rolling	Determines roll in rate satisfactory & need to place pipper slightly ahead of Dart	CR-9a O 274 1 C: VA CM; 2 Mo: MC; 3 Mo: R 4-C; CP; Ai R St 70; 280; V-4 Maintains coordinated aileron, rudder & stabilator pressure

SITUATION Two ship element set up in fighting wing formation, lead aircraft is the shooter, approximately 5,000 - 7,000' behind DART, and 2,000 - 3,000' above DART target.

TASK NO. CR-9a **TASK** Racetrack Pattern DART firing **AIRCRAFT** F-4E

TASK GOAL Align aircraft in DART plane and fire **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
P.	PREPARES TO MAINTAIN RATE OF TURN AND CONVERT TO LEAD PURSUIT Visual-Pitch att: increasing Bank att: roll Dart Aural-Chg. in aircraft sound, *communication - WSO Control-Increased aileron, rudder & stabilator pressure Motion-Positive G, pitching up, rolling	Anticipates matching turn rate with speed of Dart Sustains turn	CR-9a P 357 1 C: VA CM; 2 Mo: MR (I); 3 Mo: R 4-C; CP; Ai St 55; 110; V-2 Maintains required aileron & stabilator control
Q.	MAINTAINS RATE OF TURN & CLIMB RATE (LEAD PURSUIT) Visual-Pitch att: increasing Bank att: roll Dart Aural-Normal aircraft sound, *communication - WSO Control-Aileron & stabilator pressure Motion-Positive G, pitching up, rolling	Determines rate of turn approaching speed of Dart & need for trim	CR-9a Q 260 1 C: VA CM; 2 Mo: MC; 3 Mo: A 4-C; CP; Ai Rud St / Tr 45; 225; V-5 Coordinates aileron, rudder & stabilator pressure; adjusts trim
R.	ESTABLISHES PROPER LINE OF SIGHT TO TARGET (IN THE DART PLANE) Visual-Pitch att: constant Bank att: constant Sight/Dart Aural-Normal aircraft sound *communication - WSO Control-Increased aileron, rudder & stabilator pressure, trim switch function Motion-Positive G, pitch & roll stabilized.	Determines proper sight picture approaching for Dart aiming point Sustains turn	CR-9a R 297 1 C: VA CM; 2 Mo: MC (I); 3 Mo: A 4-C; CP; Ai St Ru 55; 110; V-2 Maintains required aileron, rudder & stabilator pressure
S.	CONTINUES LEAD PURSUIT CURVE Visual-Pitch att: constant °(variable) Bank att: constant °(variable) Sight/Dart Aural-Normal aircraft sound, *communication - WSO Control-Aileron, rudder & stabilator pressure Motion-Positive G, pitch & roll °constant	Determines proper rate of closure established & need to reduce power	CR-9a S 277 1 C: VA CM; 2 Mo: MC; 3 Mo: R 4-C; CP; Ai R St Th 50; 100; V-2 Maintains required aileron, stabilator & rudder pressure; adjusts throttle

SITUATION Two ship element set up in fighting wing formation, lead aircraft is the shooter, approximately 5,000 - 7,000' behind DART, and 2,000 - 3,000' above DART target.

TASK NO. CR-9a **TASK** Racetrack Pattern DART firing **AIRCRAFT** F-4E

TASK GOAL Align aircraft in DART plane and fire **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
T.	ESTABLISHES DESIRED CLOSURE RATE Visual-Pitch att: °constant Bank att: °constant Dart/pipper Analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Increased stabilator pressure, throttle reduction Motion-Positive G, pitch & roll °constant	Determines pipper & Dart wingspan are nearly the same size (2500') & need to comfirm to WSO, radar is locked on Dart	CR-9a T 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai Tr Ev Cm St 55; 110; V-2 Maintains required aileron, stabilator & rudder pressure, adjusts trim, communicates - WSO
U.	CONTINUES CLOSURE Visual-Pitch att: °constant Bank att: °constant Dart/pipper Analog bar Aural-Normal aircraft sound, communication - WSO (calls ready to fire) Control-Aileron, stabilator & rudder pressure, trim switch function Motion-Positive G, pitch & roll ° constant	Determines 2000' range approaching & need to smoothly move pipper to Dart, & need to stabilize power before firing	CR-9a U 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai St Tr Ev 60; 120; V-2 Maintains required aileron, stabilator & rudder pressure; adjusts throttle
V.	STARTS FIRING Visual-Pitch att: °constant Bank att: °constant Dart/pipper Analog bar Aural-Chg. in aircraft sound, *communication - WSO Control-Aileron, stabilator & rudder pressure; throttle decreased Motion-Positive G, pitch & roll °constant	Determines pipper on target, 1500' range, & need to fire gun	CR-9a V 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ai St Ds Ev 70; 140; V-2 Maintains required aileron, stabilator & rudder pressure; activates trigger
W.	STOPS FIRING/STARTS BREAKAWAY Visual-Pitch att: °constant Bank att: °constant Dart (hit) Aural-Normal aircraft sound, weapons discharge, communication - WSO (calls 1000' & cease fire) Control-Aileron, stabilator & rudder pressure; trigger function Motion-Positive G, pitch & roll °constant	Determines need to breakaway from Dart pursuit, and call out "hit"	CR-9a W 277 1 C: VA CM; 2 Me: MC; 3 Mo: R 4-C; CP; Ds Ev Ai Cm St Tr 60; 120; V-2 Deactivates trigger; Moves aileron, rudder, & stabilator; activates mic. switch; communicates; moves throttle

SITUATION Two ship element set up in fighting wing formation, lead aircraft is the shooter, approximately 5,000 - 7,000' behind DART, and 2,000 - 3,000' above DART target.

TASK NO. CR-9a **TASK** Racetrack Pattern DART firing **AIRCRAFT** F-4E

TASK GOAL Align aircraft in DART plane and fire **DATE** Sept., 1977

EL. SEQ.	1 CUES	2 MENTAL ACTION	3 MOTOR ACTION
X.	CONTINUES BREAKAWAY OUT OF DART PLANE Visual-Pitch att: increasing Bank att: roll Dart Tow ship Aural-Chg. in aircraft sound, communication Control-Increased aileron, rudder & stabilator pressure; mic.switch function; throttle adv; trigger function Motion-Increased positive G, pitching up, rolling	Determines adequate clearance from Dart & need to fly 45° up & away from Dart	CR-9a X 277 1 C / 2 Mo / 3 Mo VA CM / MC / R 4-C / CP / A/C R/C 75 / 150 / V-2 Maintains aileron, rudder & stabilator pressure
Y.	STARTS TO RE-ESTABLISH PERCH Visual-Pitch att: increasing Bank att: roll Dart Tow ship Flt.Inst: Alt, A/S Aural-Chg. in aircraft sound, communication (wingman confirms hit) Control-Constant aileron, rudder & stabilator pressure Motion-Positive G, pitching up, rolling	POSITION Determines need to reverse turn & climb to perch position (maintains a constant position on Dart)	CR-9a Y 280 1 C / 2 Mo / 3 Mo VA CM / MC / R 4-C / CP / A/C R/C SC 70 / 350 / V-S Coordinates aileron & rudder, maintains stabilator pressure
Z.	CONTINUES ROLL IN TO REVERSE Visual-Pitch att: constant Bank att: roll Dart Tow ship Flt.Inst: Alt, A/S Aural-Normal aircraft sound, communication (tow ship calls "cease fire") Control-Inc. aileron & rudder pressure, constant stabilator pressure Motion-Positive G, pitching up, rolling	TURN Determines roll rate satisfactory & need to reply to cease fire	CR-9a Z 277 1 C / 2 Mo / 3 Mo VA CM / MC / R 4-C / CP / A/C R/C Cm 65 / 130 / V-2 Maintains aileron, rudder & stabilator pressure; activates mic. switch; communicates
AA.	STOPS ROLL IN TO TURN Visual-Pitch att: constant Bank att: roll Dart Tow ship Aural-Normal aircraft sound, communication Control-Constant aileron, rudder & stabilator pressure, mic. switch function Motion-Positive G, pitching up, rolling	Determines proper turning rate approaching to maintain position on Dart	CR-9a AA 280 1 C / 2 Mo / 3 Mo VA CM / MC / R 4-C / CP / A/C R/C SC 60 / 300 / V-S Coordinates aileron & rudder pressure with inc.stabilator pressure

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